Witness tree analysis of Native American influences on the distribution of forest trees

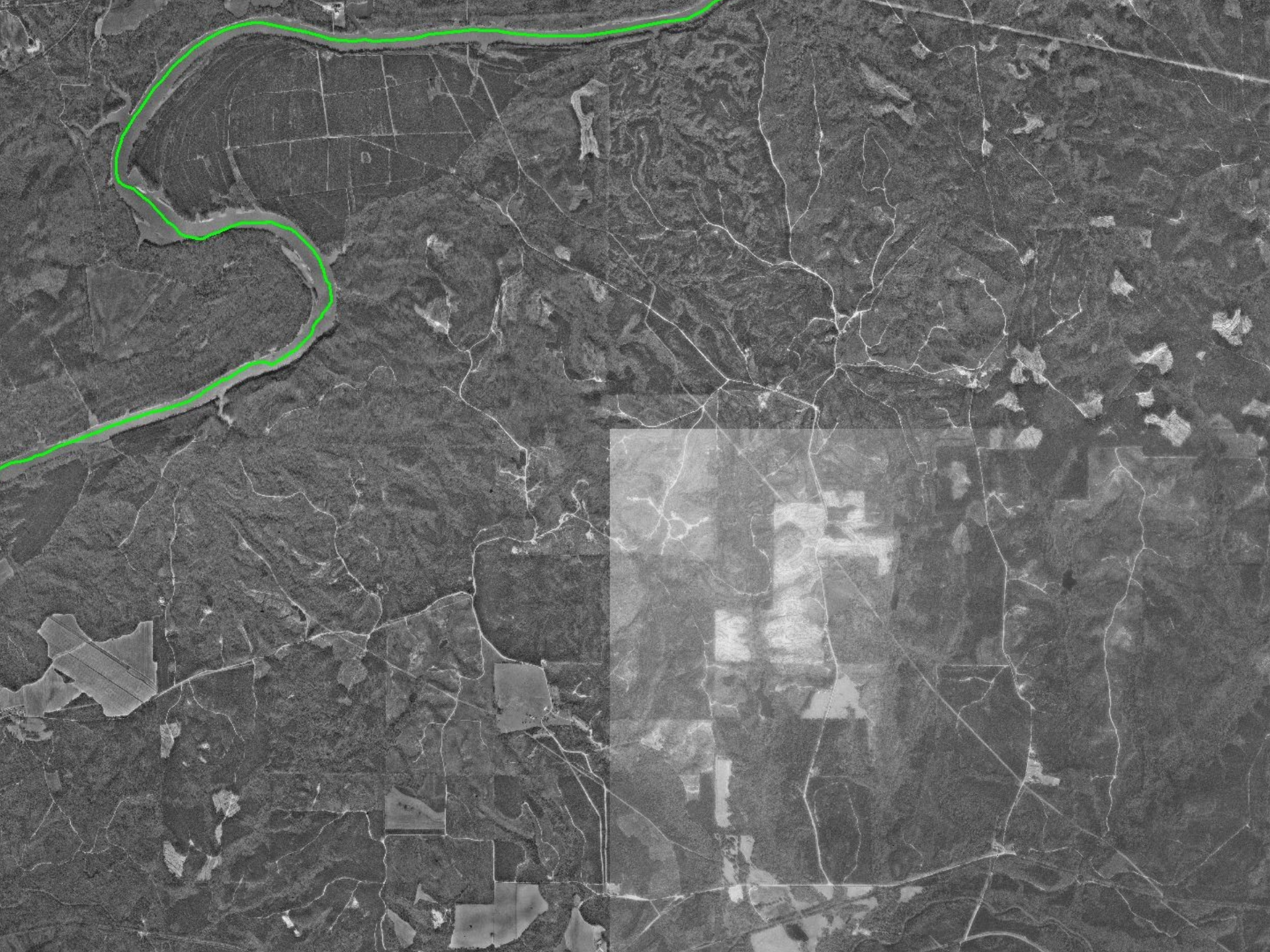
An example among the Creek Indians of the Southeastern U.S.

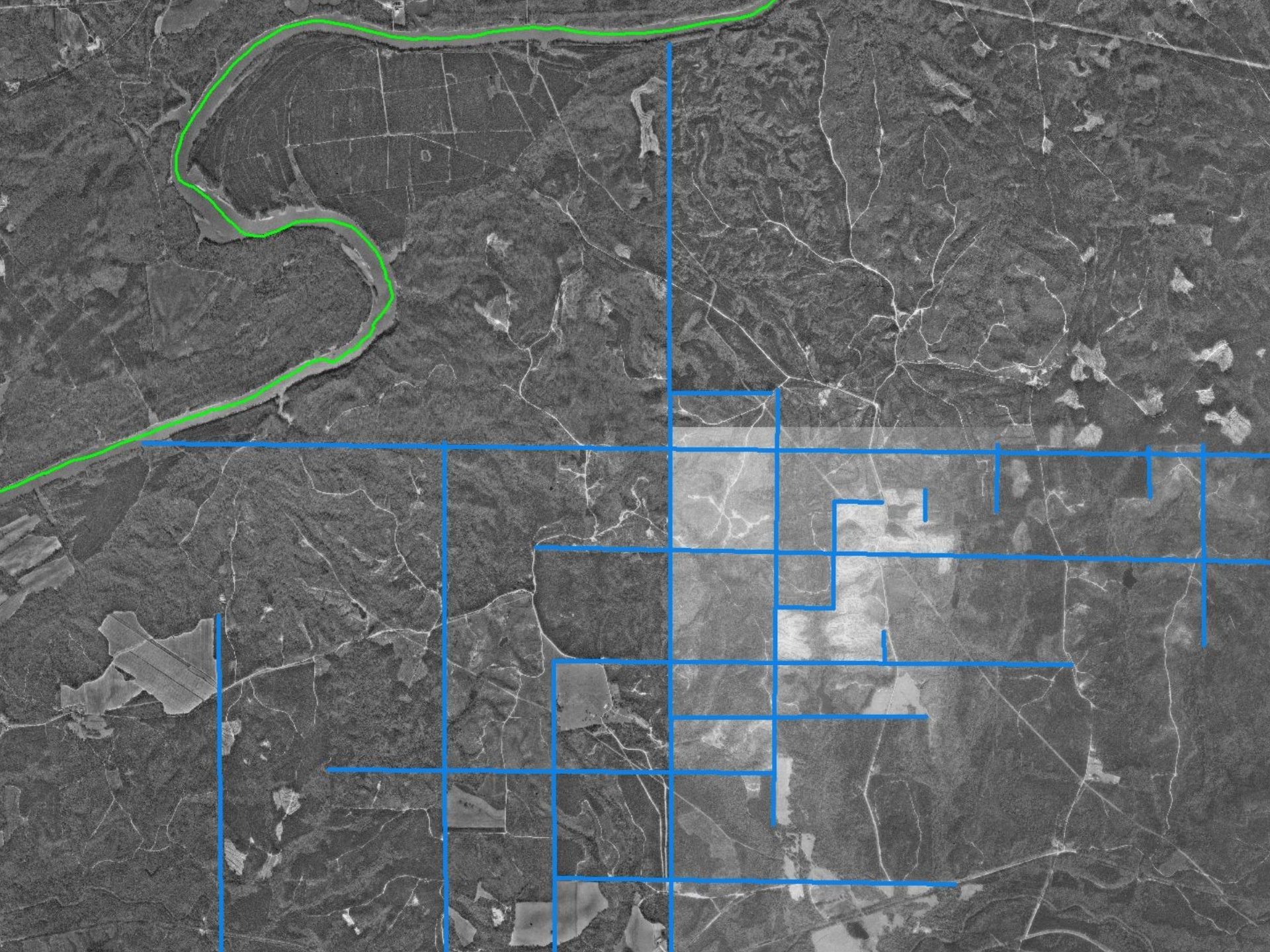
Thomas Foster

Panamerican Consultants, Inc.

Witness Tree Studies

- Historic Land Survey for public distribution
- Conducted by state and federal government
- Conducted between 1827 and 1840’s





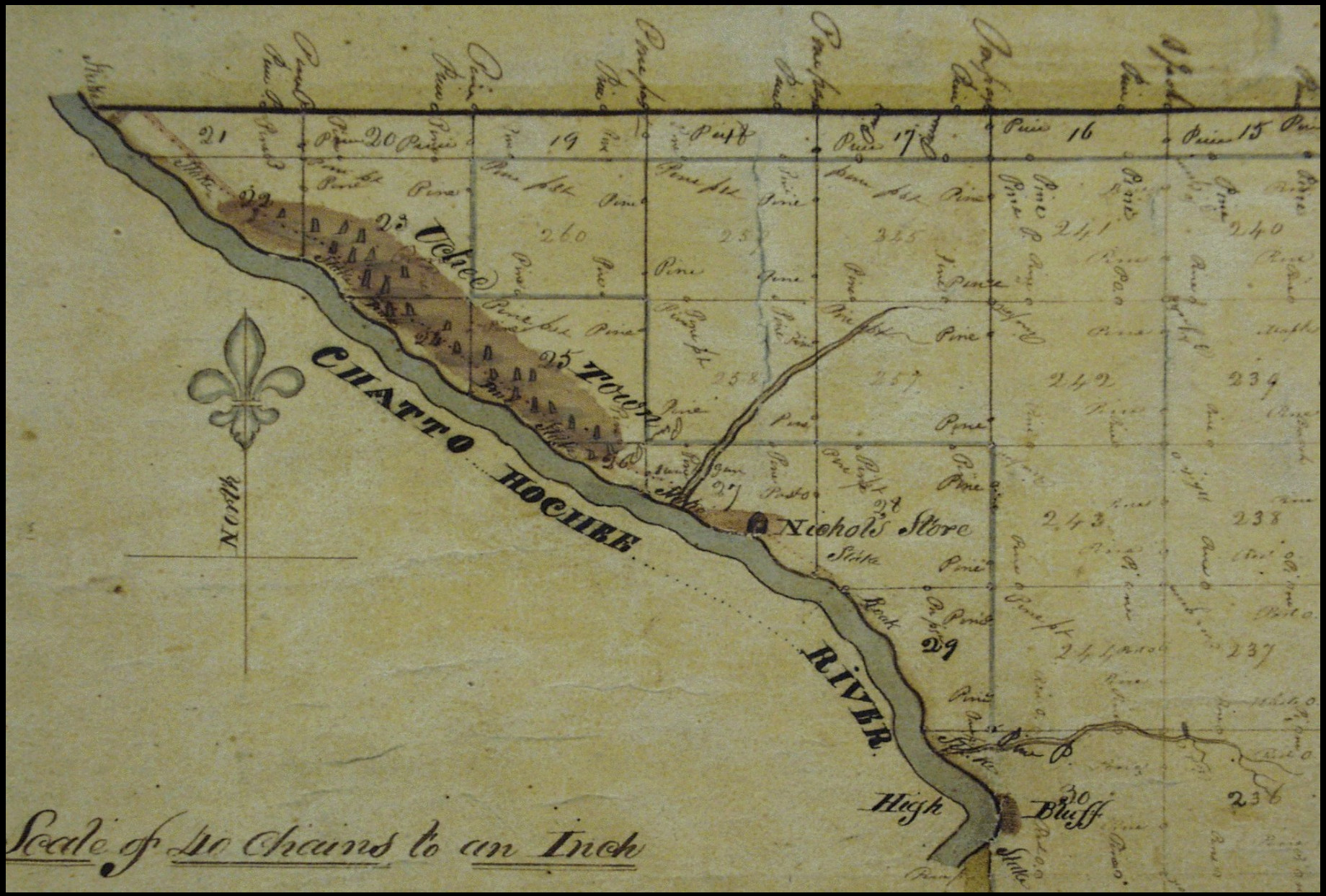
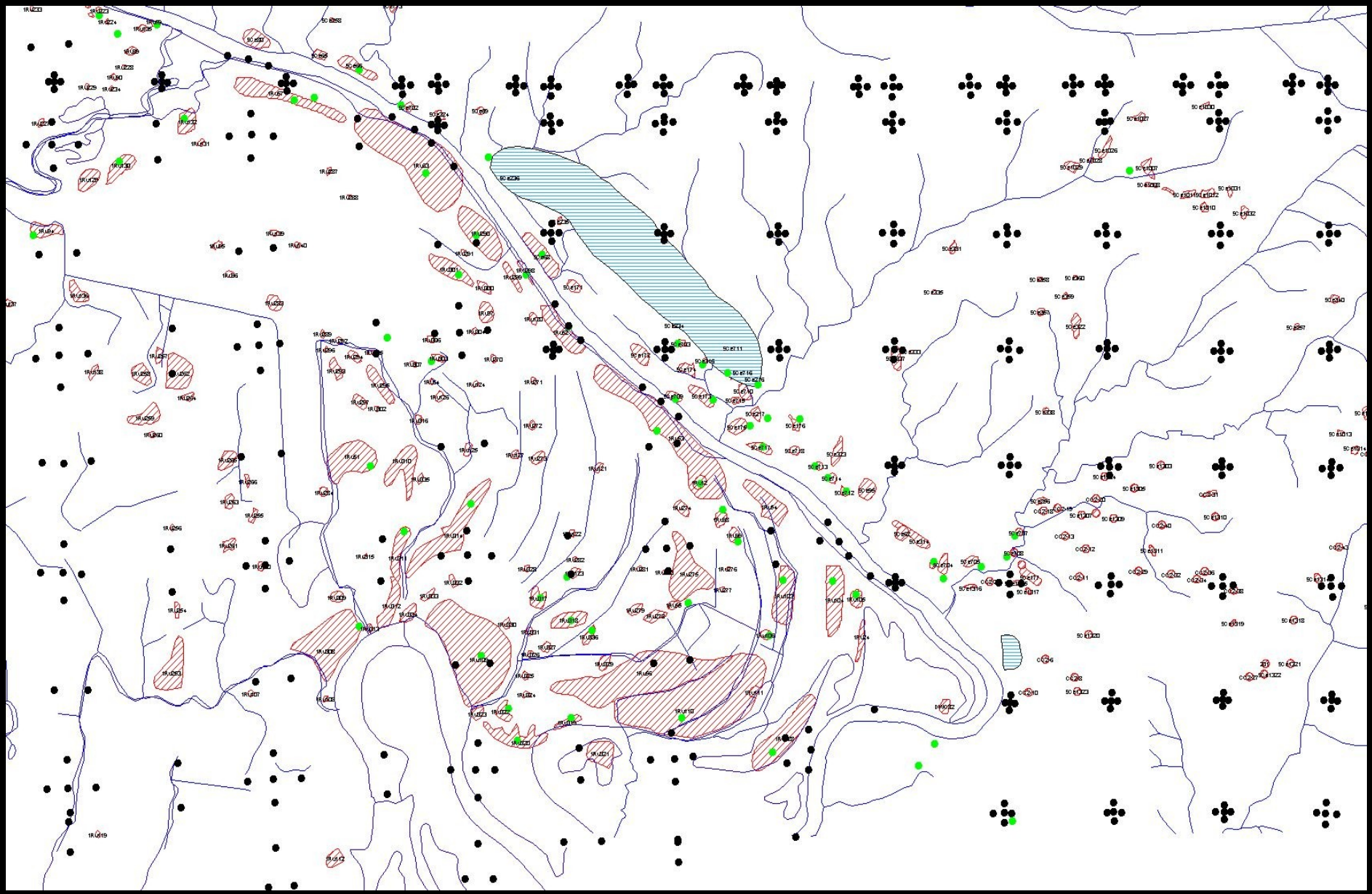
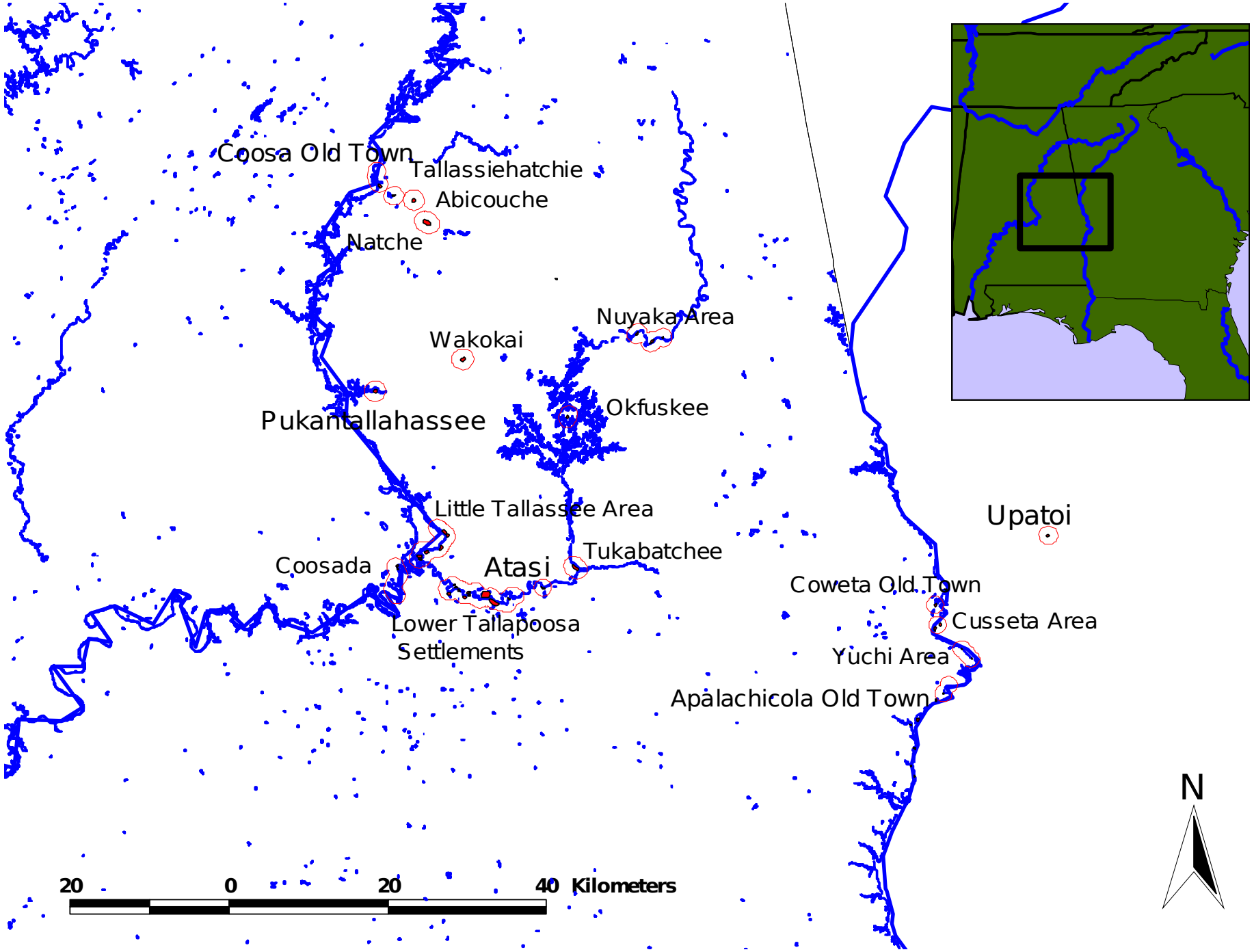


Photo of 1827 Survey Map showing “Uchee Town”



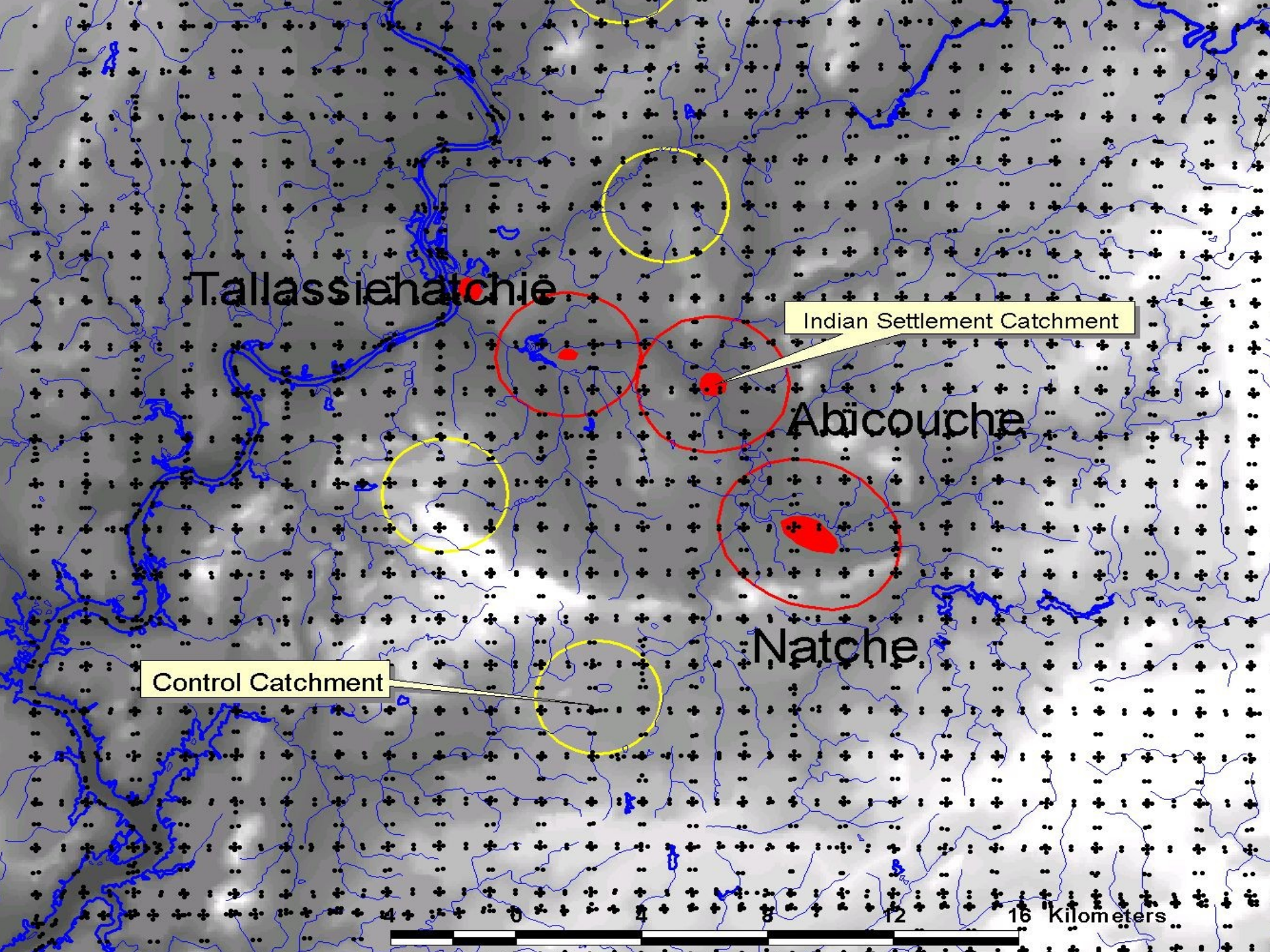
Digitized Layer of Historic Trees


Coosa Old Town
Tallassiehatchie
Abicouche
Natche
Nuyaka Area
Wakokai
Pukantallahassee
Okfuskee
Little Tallassee Area
Upatoi
Tukabatchee
Coosada
Atasi
Coweta Old Town
Cusseta Area
Lower Tallapoosa
Settlements
Yuchi Area
Apalachicola Old Town
20 0 20 40 Kilometers
N

Catchment Analysis

- Catchment is area of “use” (Vita-Finzi and Higgs 1970)
- Usually surrounding a habitation
- Catchment is a sample of trees

- Compare trees in “settlement” catchments to control catchments


Tallassiehatchie
Indian Settlement Catchment
Abicouche
Natche
Control Catchment
4 0 4 8 12 16 Kilometers

Creek Indians

"War Dance" (Von Reck 1736)

Creek Indians

- Collection of southeastern Indians
- Muscogee, Hitchitee, Yuchi languages
- Coalesced around 1500
- Occupied central Alabama and Georgia
- Towns in this study occupied between approximately 1600-1830

Creek Indian Agriculture

- Horticulture
- Fields and towns on river bottoms
- Non-fertilized
- Low population density
- Moved agricultural fields when soil became exhausted

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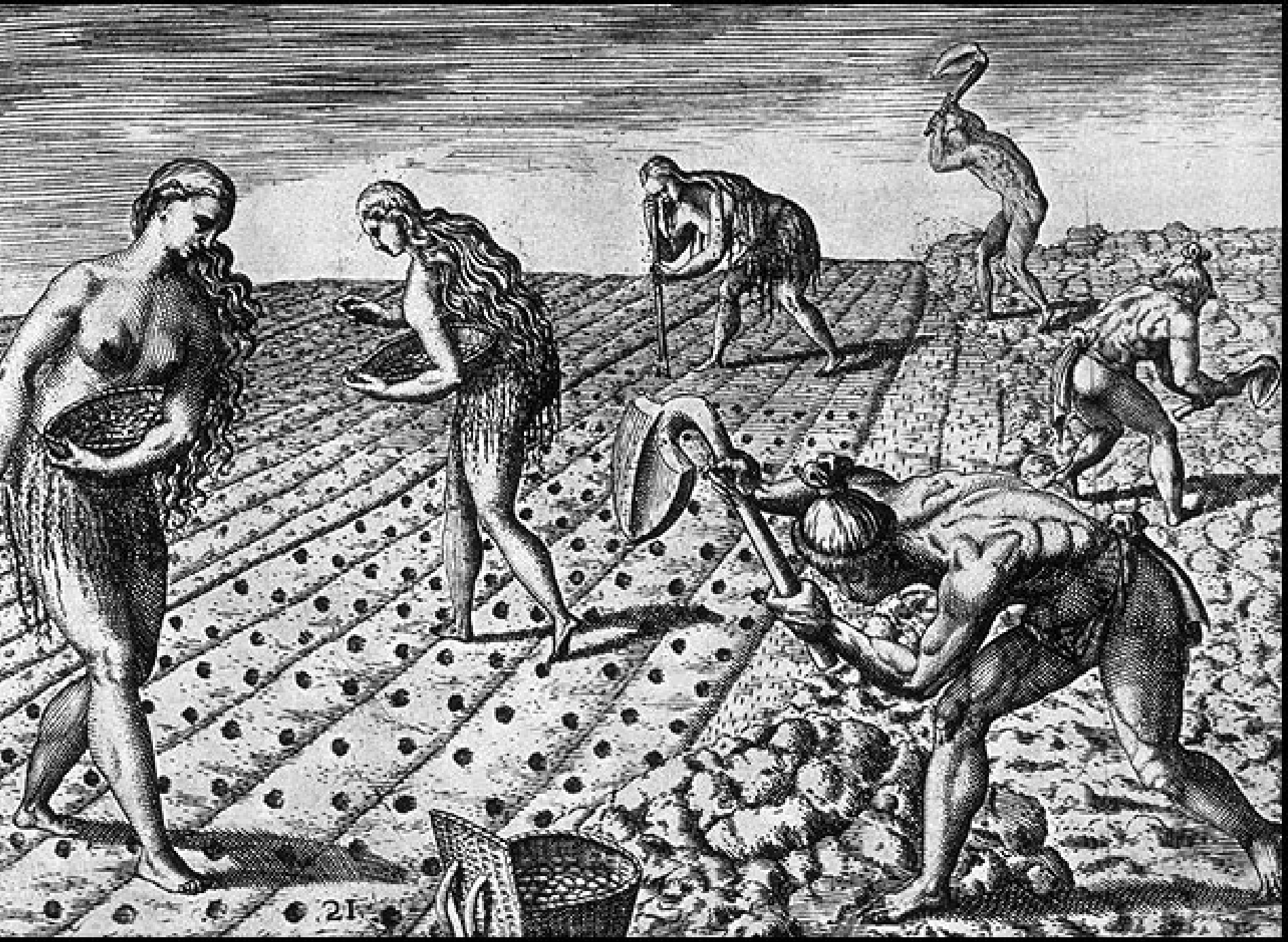
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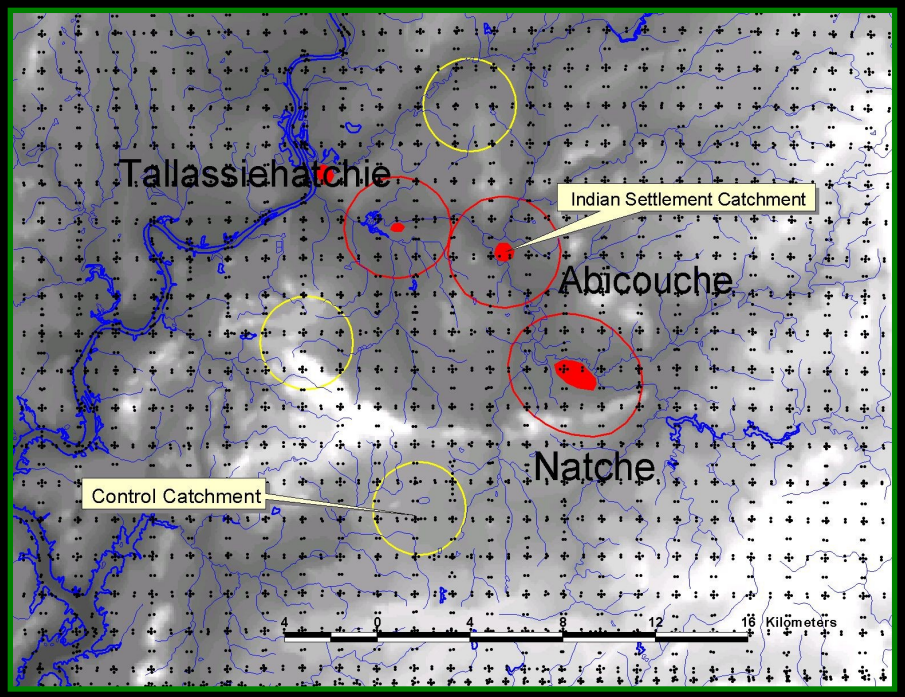
Hall, B. Mss. no. 85
Manuscripts Department, Lilly Library
Indiana University, Bloomington, Indiana

“Pine Barren on fire” in Georgia; Basil Hall, March 21, 1828

Creek Town Settlement Catchments	Approximate Dates Occupied
Apalachicola/Apalachicola Old Town	1650-1750
Atasi	1600-1830
Coosada	1775-1830
Coweta Tallahassee	1715-1800
Cusseta/Cusseta Old Town	1715-1825
Lower Tallapoosa (Fusihatchee area)	1600-1830
Lower Coosa (Little Tallassee area)	1600-1830
Tukabatchee	1600-1830
Upatoi	1790-1825
Yuchi/Chiaha area	1650-1825
Upper Tallapoosa (Okfuskoochee area)	1775-1830
Okfuskee	1725-1800
Pukantallahassee	1750-1830
Wakokai	1730-1780
Abicouchee	1725-1825
Coosa Old Town	1600-1750
Natche	1755-1830
Tallassochatchee	1770-1830

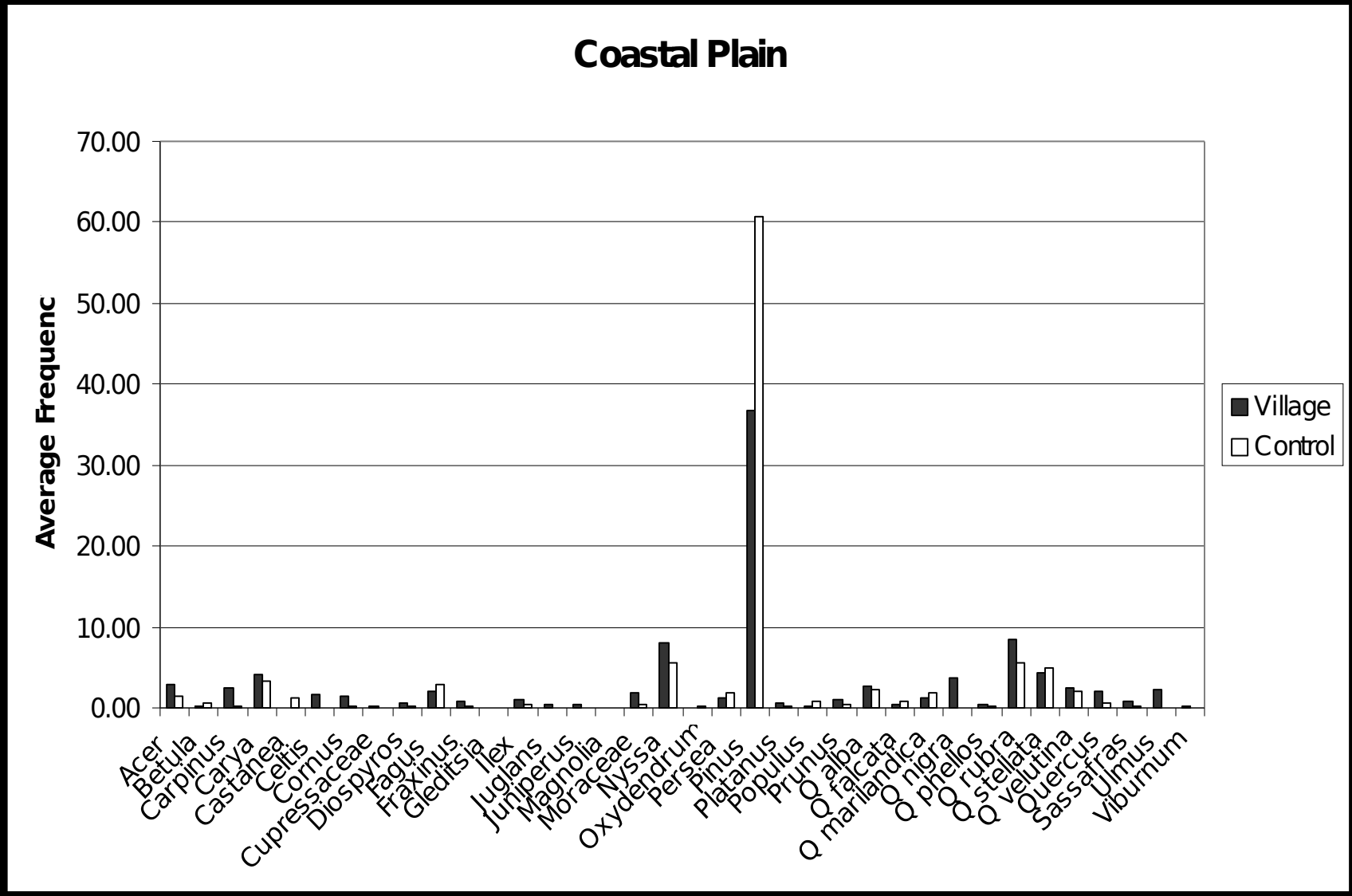
Results

- Catchment Analysis



Pine

- Building materials for structures
- Predicted reduction around villages
- Lower frequency in settlement catchments relative to control catchments


Coastal Plain
Average Frequenc
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Village
Control
Acer
Betula
Carpinus
Carya
Castanea
Celtis
Cornus
Cupressaceae
Diospyros
Fagus
Fraxinus
Gleditsia
Ilex
Juglans
Juniperus
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Nyssa
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Pinus
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Quercus
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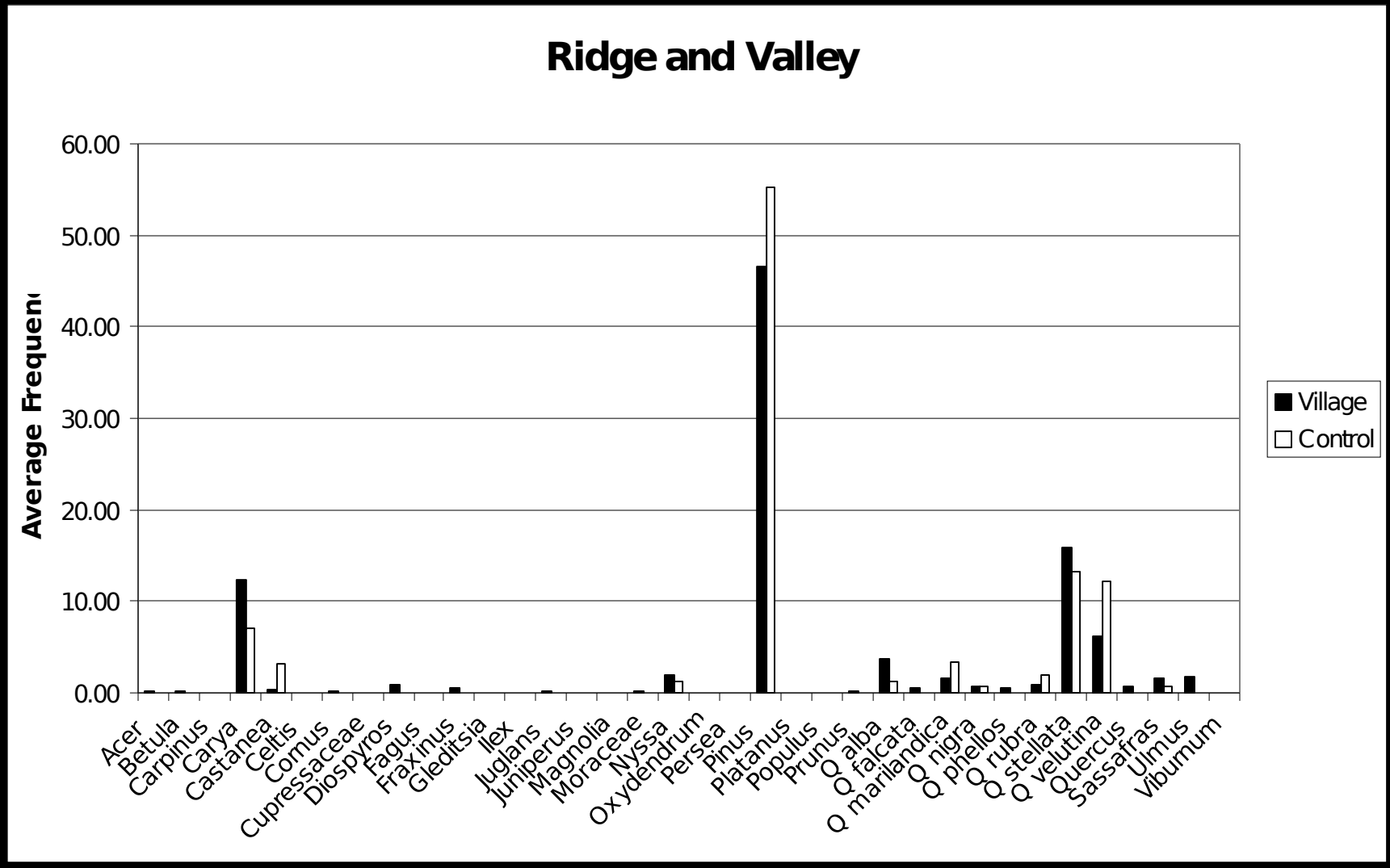
Viburnum


Ridge and Valley
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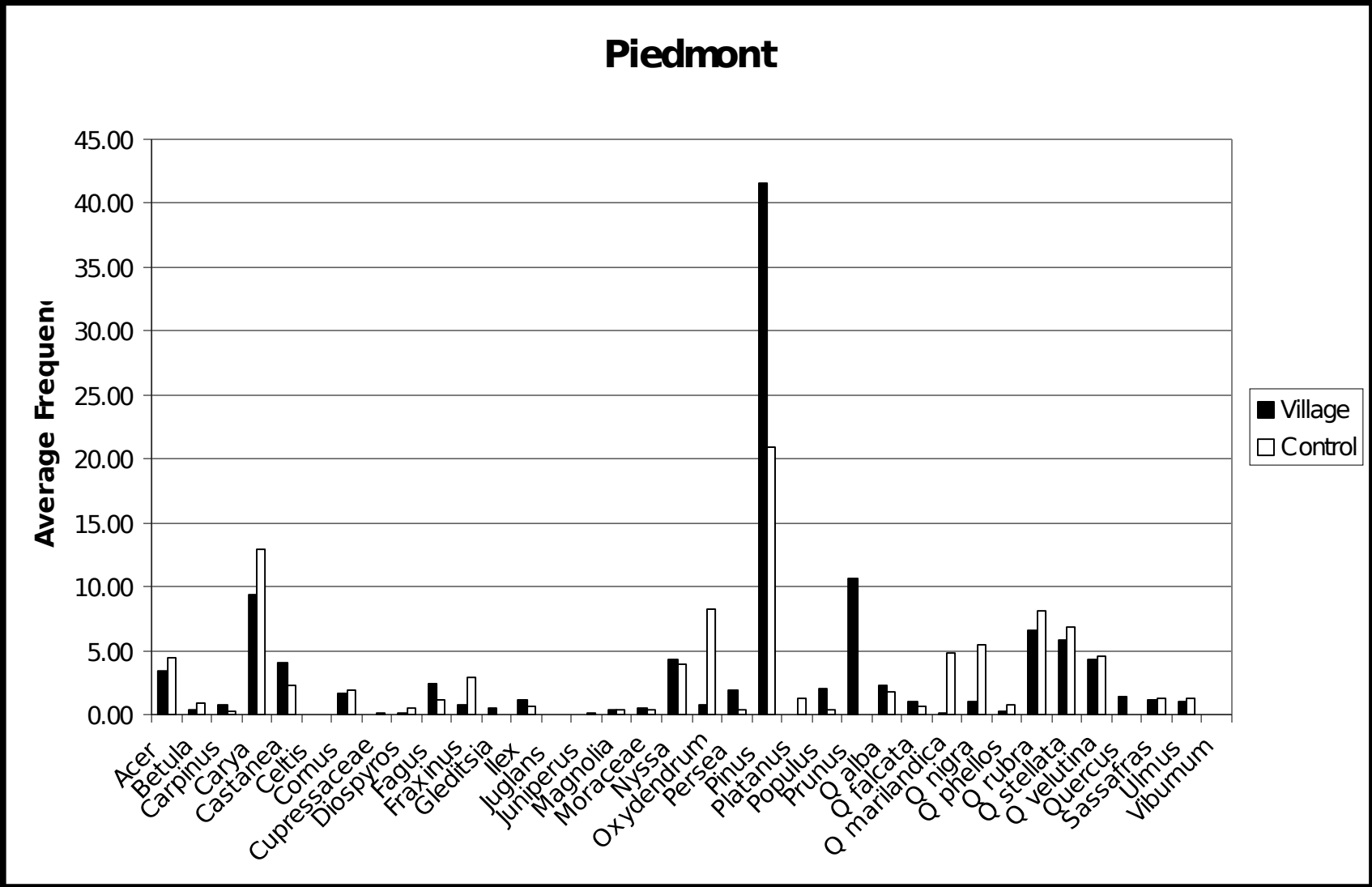
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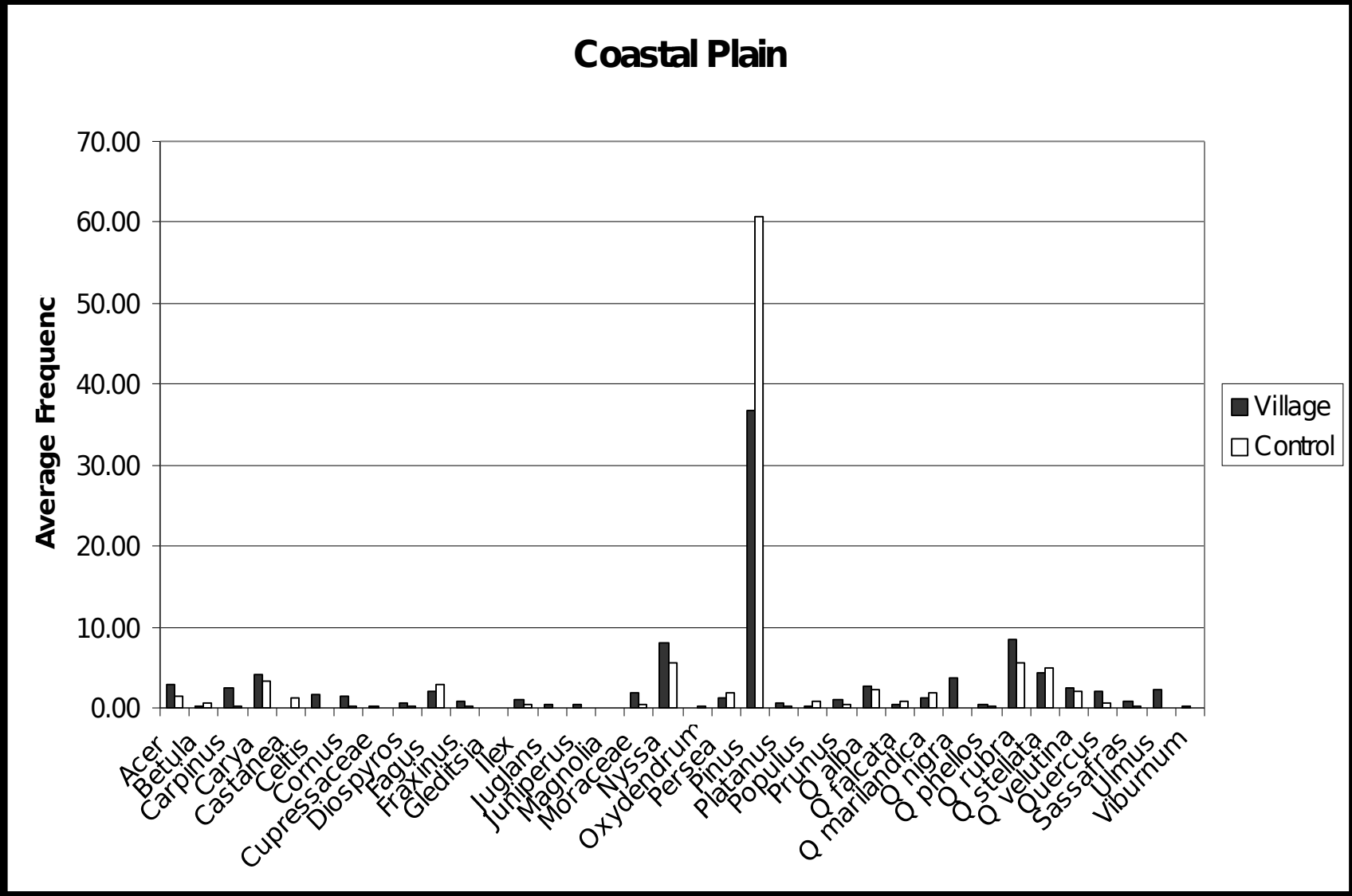
Fruit Trees

- Not actively planted; encouraged
- Only Holly (*Ilex*) was transported and planted
- Mulberry, Cherry, and Plum are more frequent in the settlement catchments relative to the controls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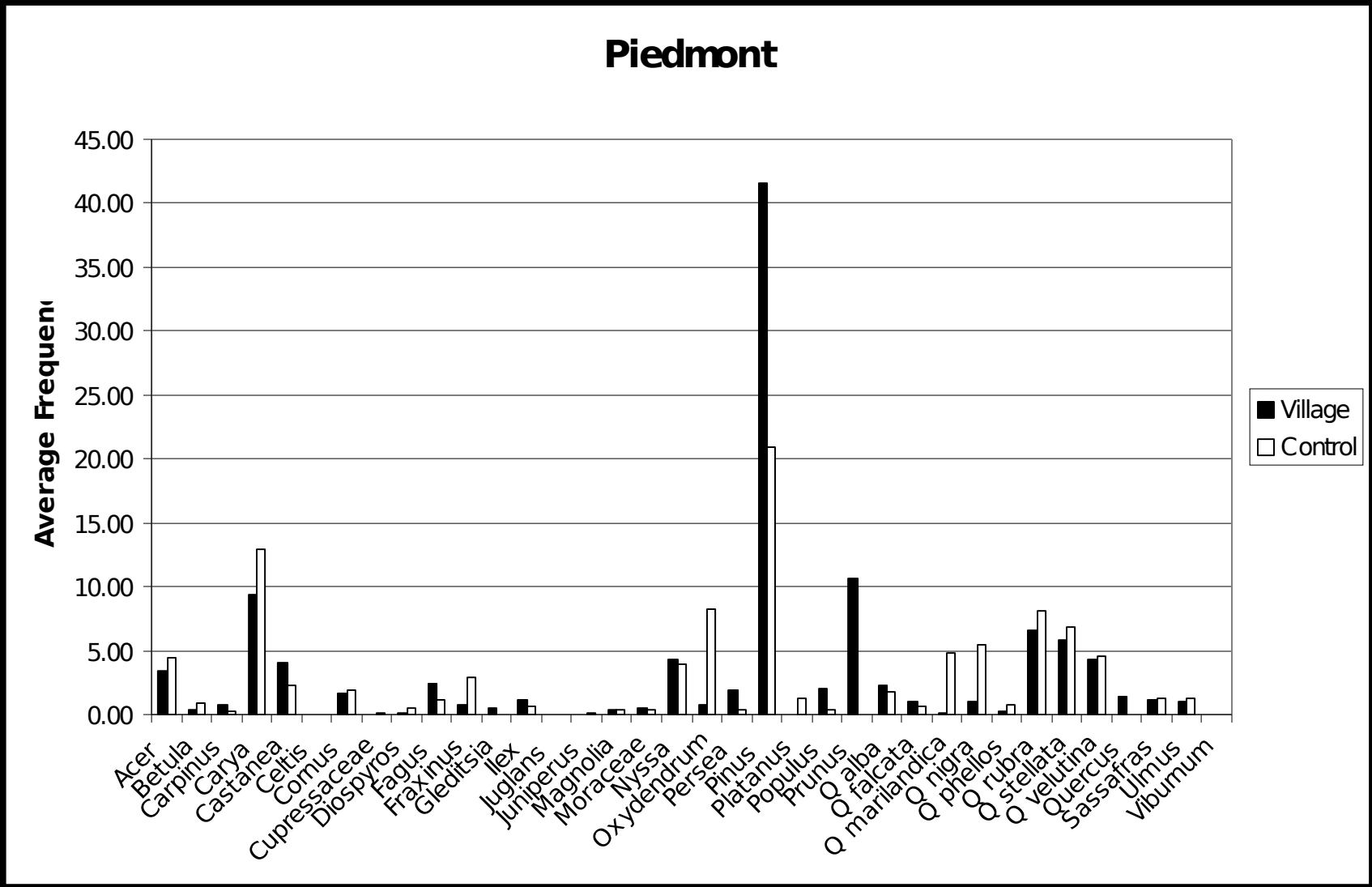
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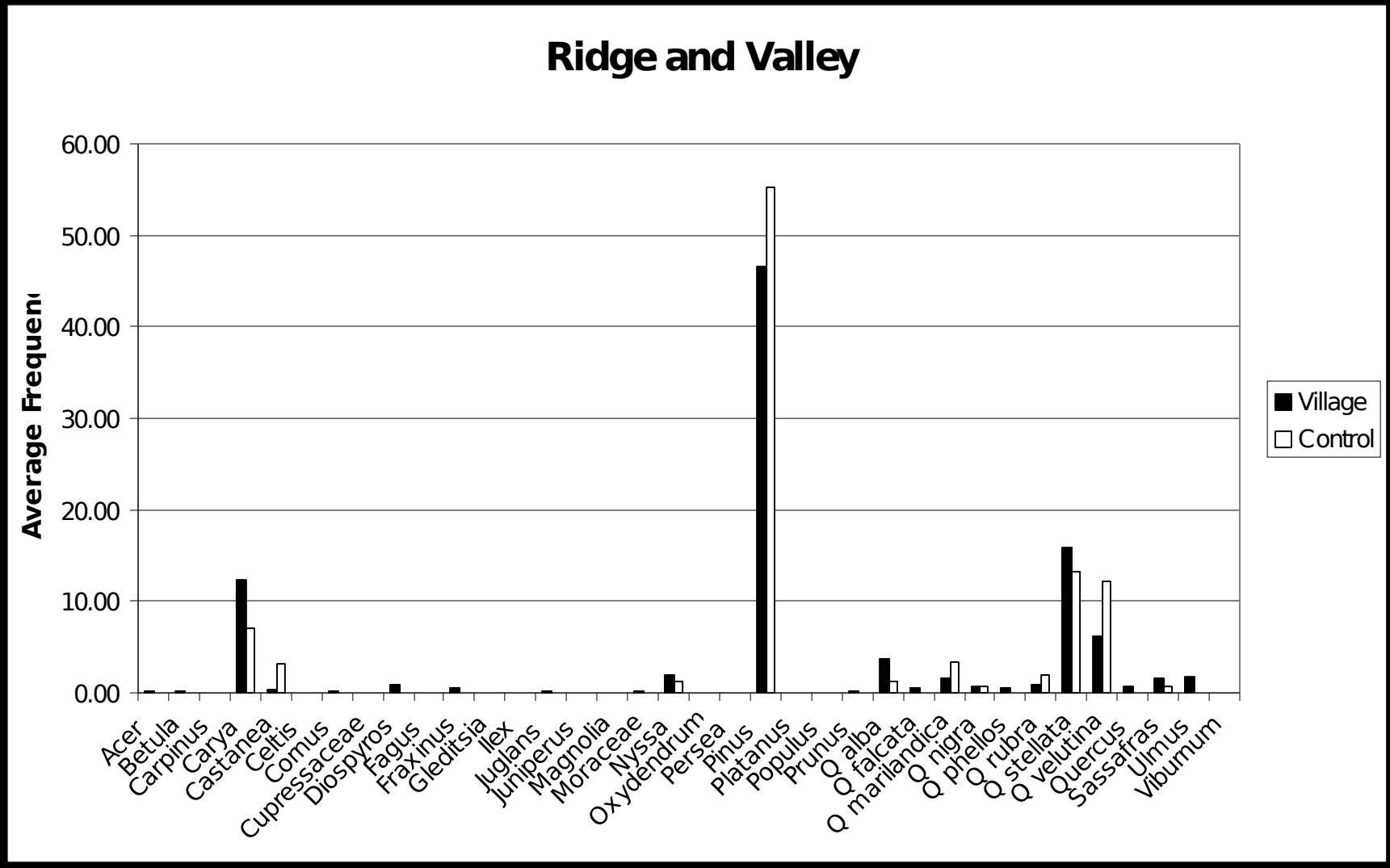
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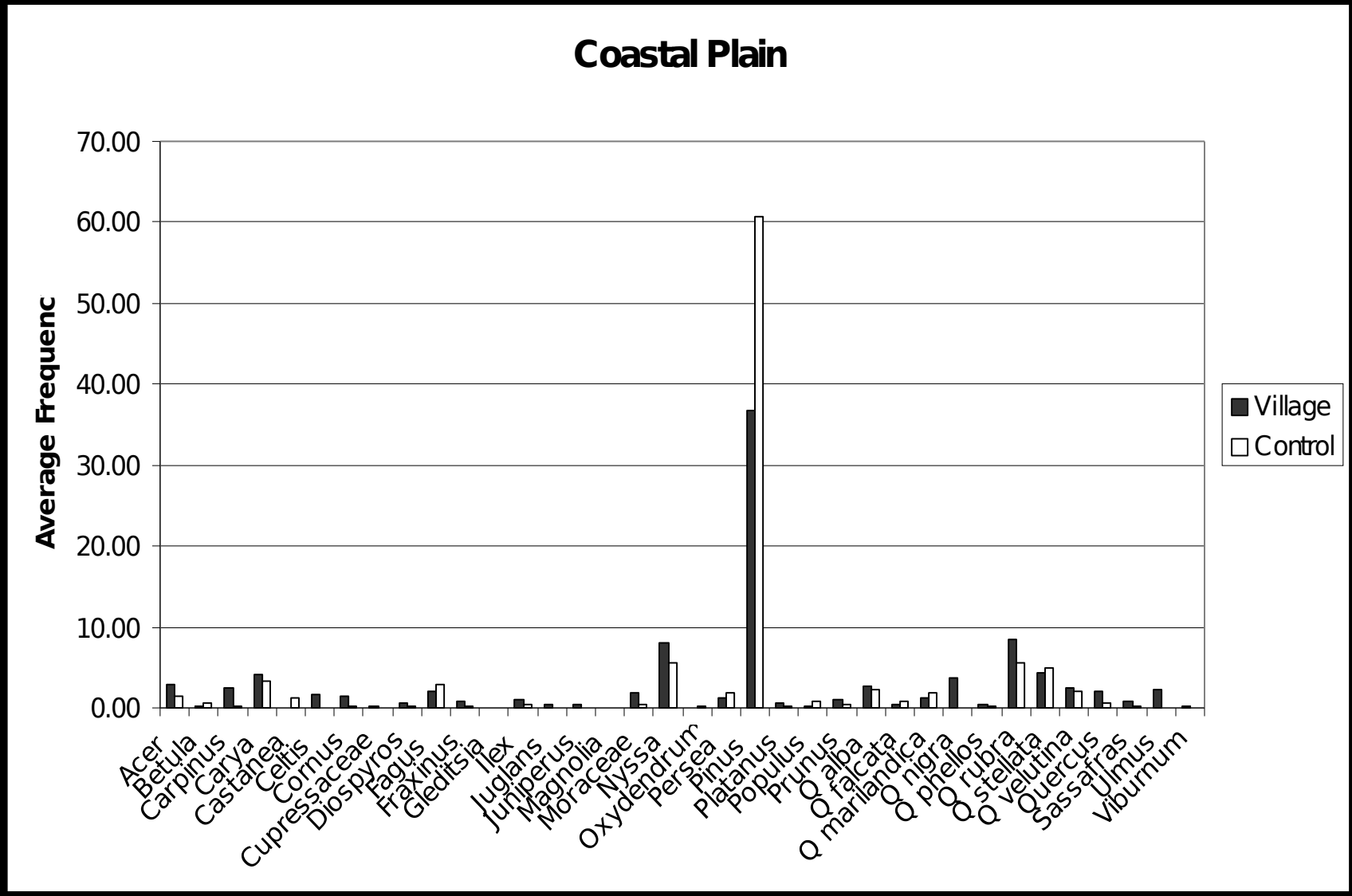
Holly

- “The Indians call it the beloved tree, and are very careful to keep them pruned and cultivated” (Bartram in Waselkov and Braund 1995, 82)
- Higher frequency in village settlements although not statistically s =0.69)

Agricultural Techniques

- Early succession species
- “...in the antient cultivated fields, 1. Diospyros, 2. Gleditsia triacanthos, 3. Prunus Chicasaw, 4. Callicarpa, 5. Morus rubra, 6. Juglans exaltata, 7. Juglans nigra...” (Waselkov and Braund 1995, 39)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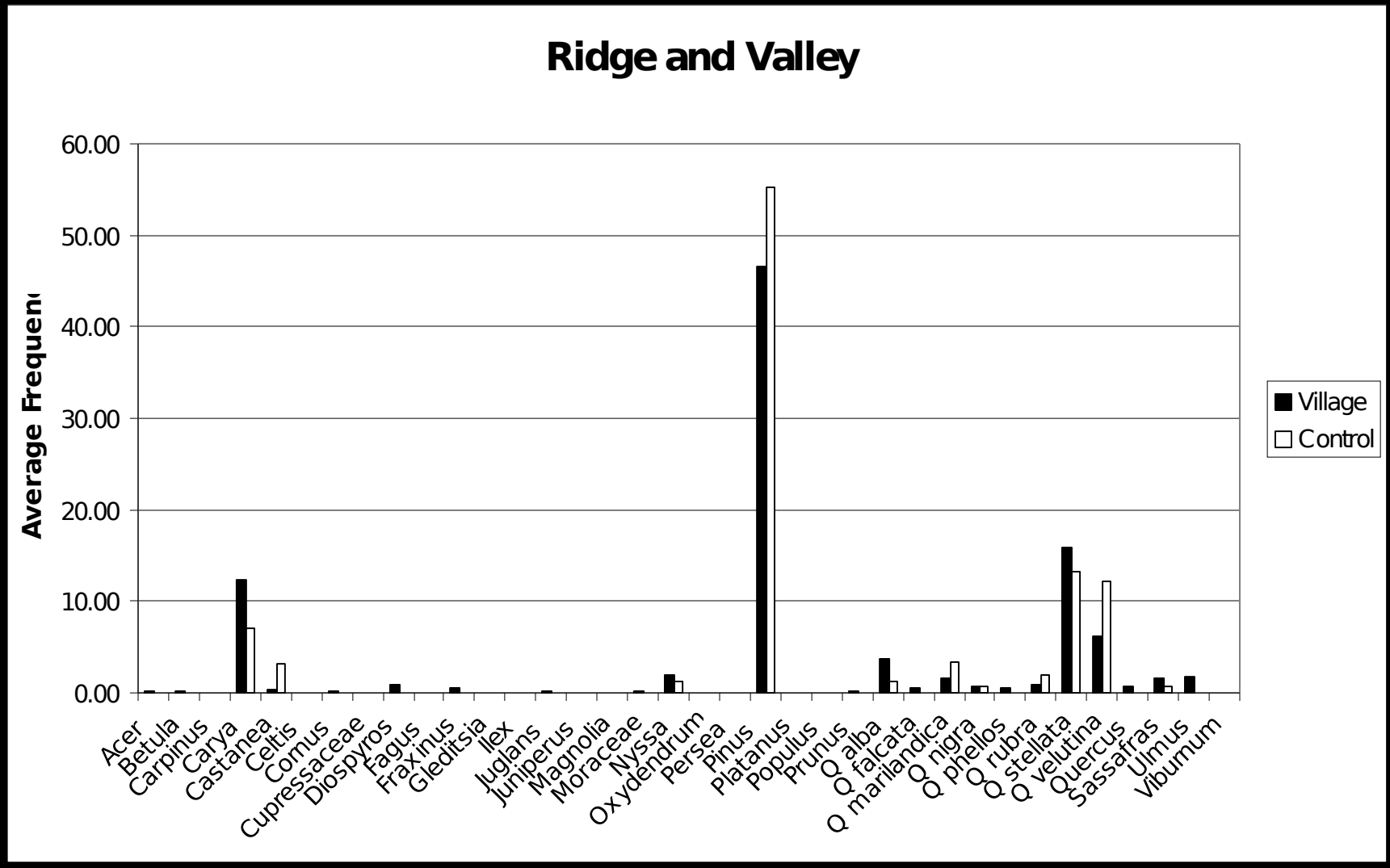
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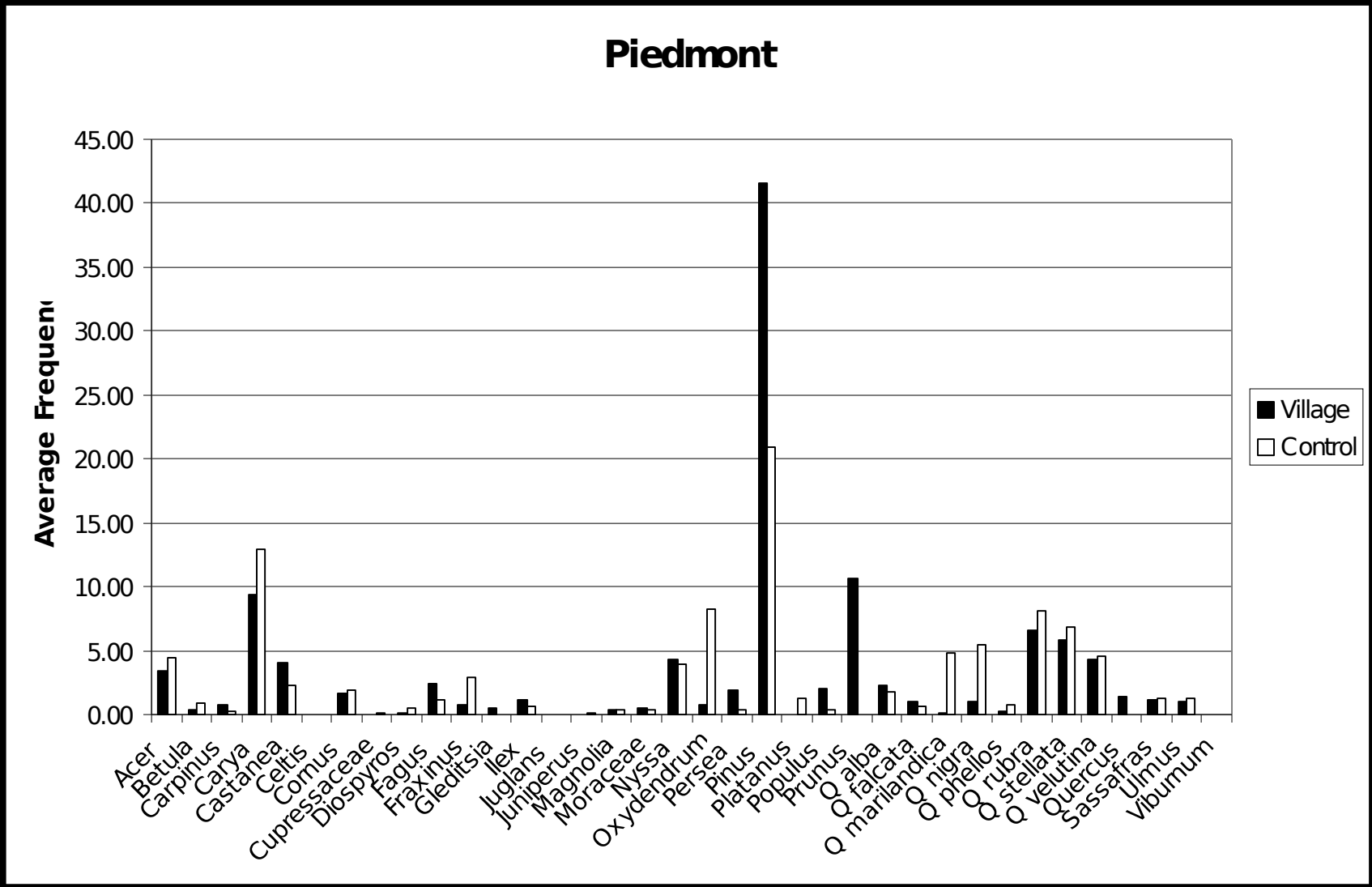
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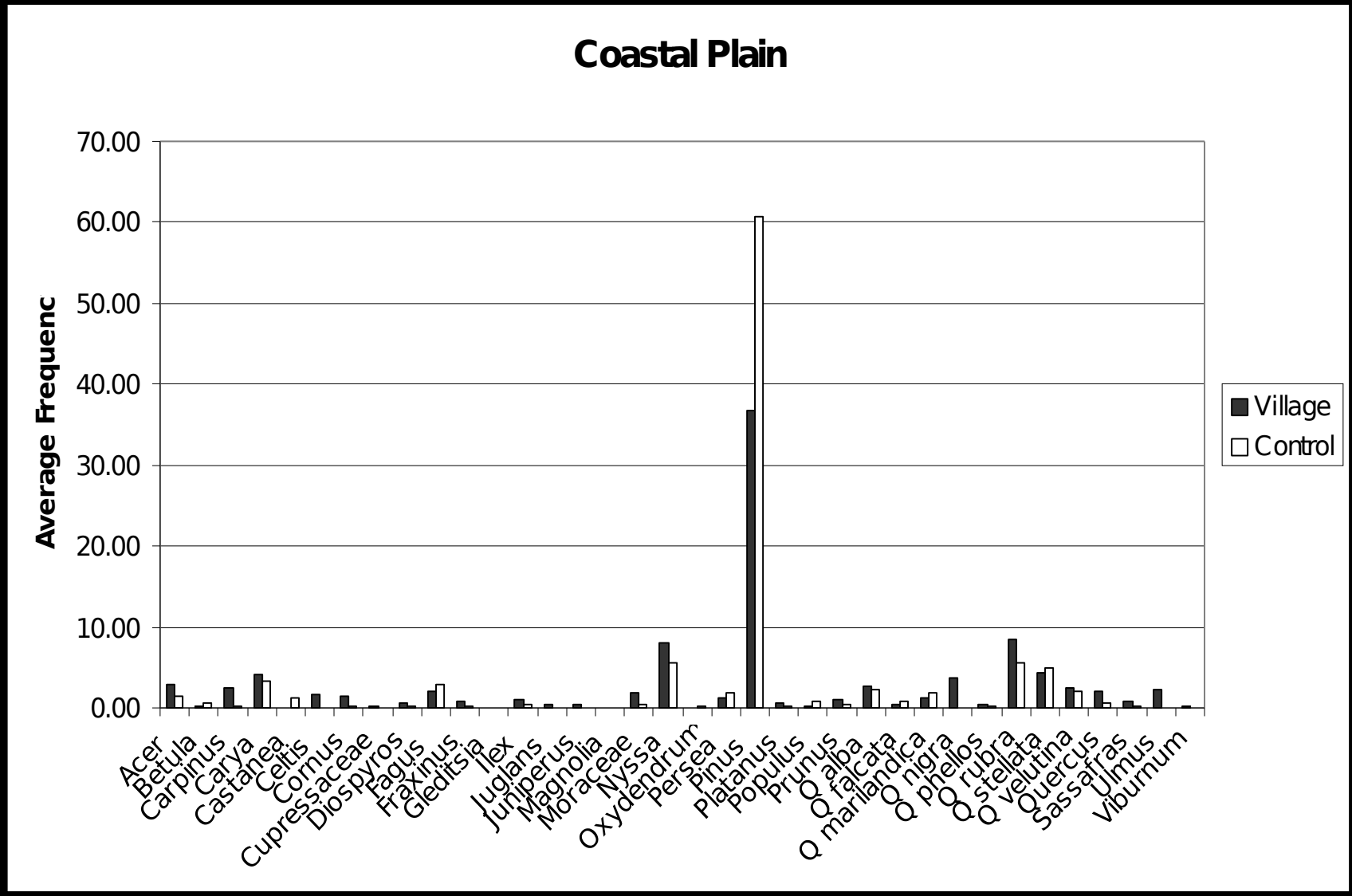
Nut Trees

- Hickory oil was consumed
- “…and the fruit is in great estimation with the present generation of Indians, particularly Juglans exalta commonly called shell-barked hickory; the Creeks store up the latter in their towns. I have seen above an hundred bushels of these nuts belonging to one family” (Bartram in Waselkov and Braund 1995, 39)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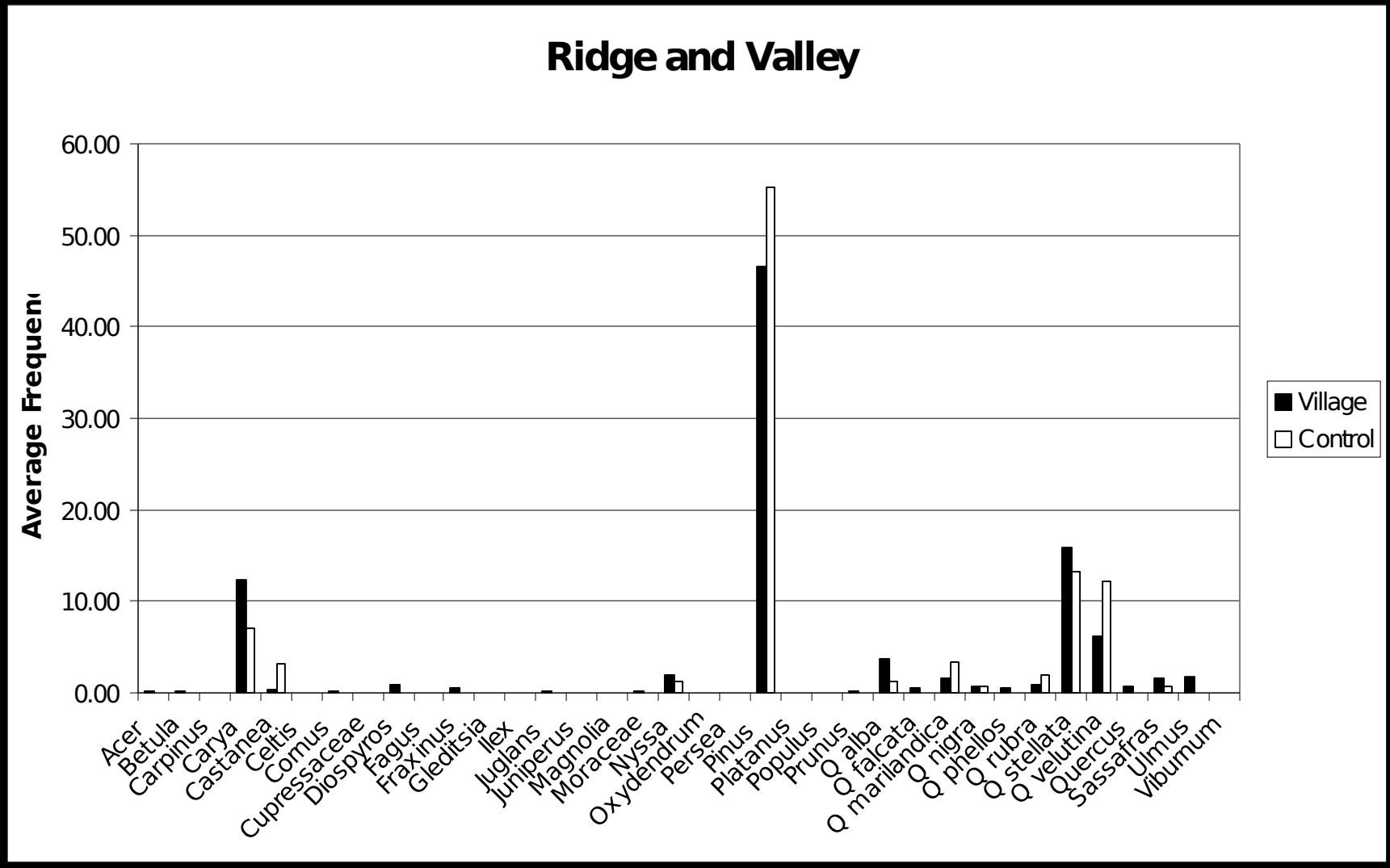
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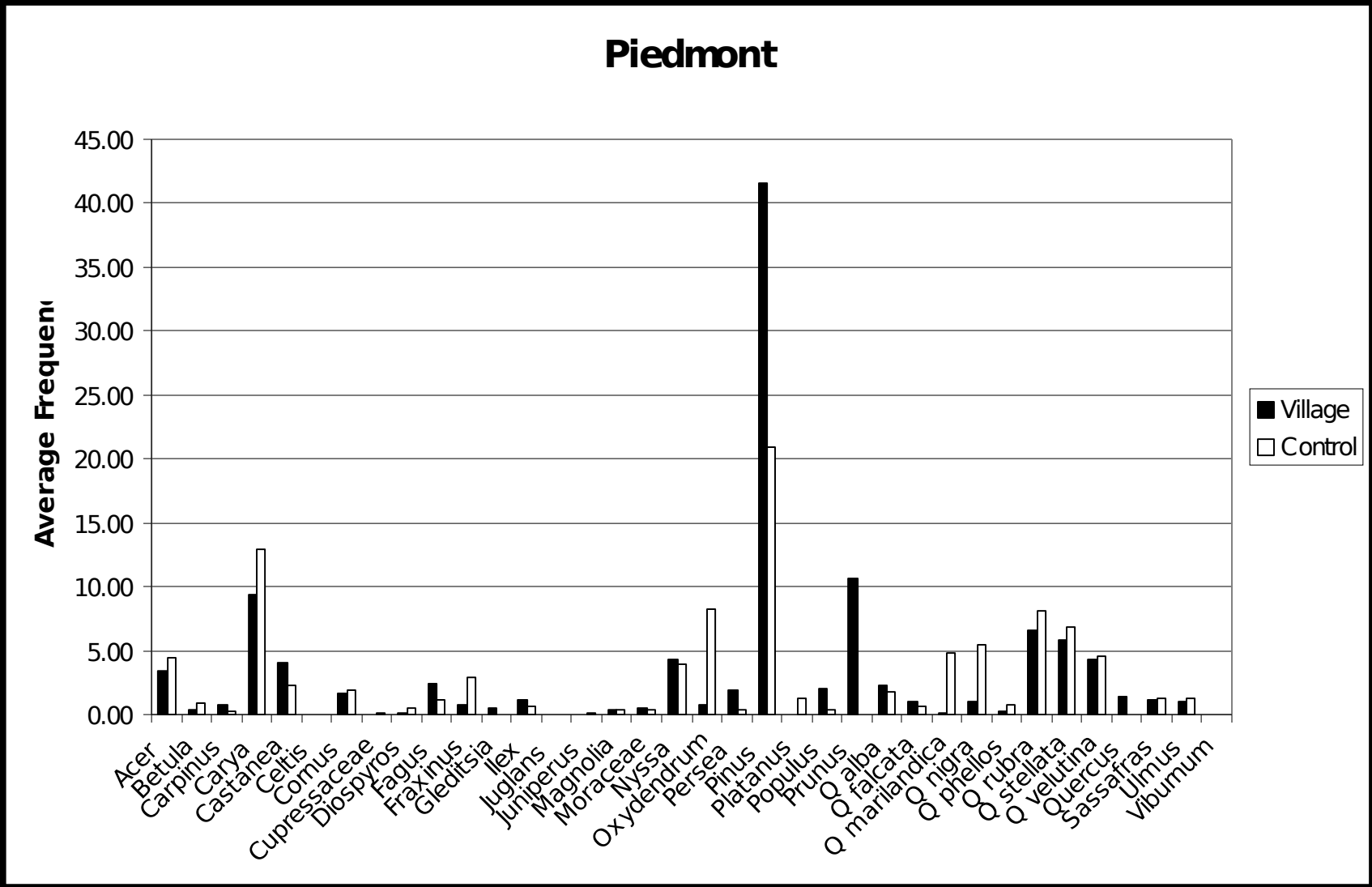
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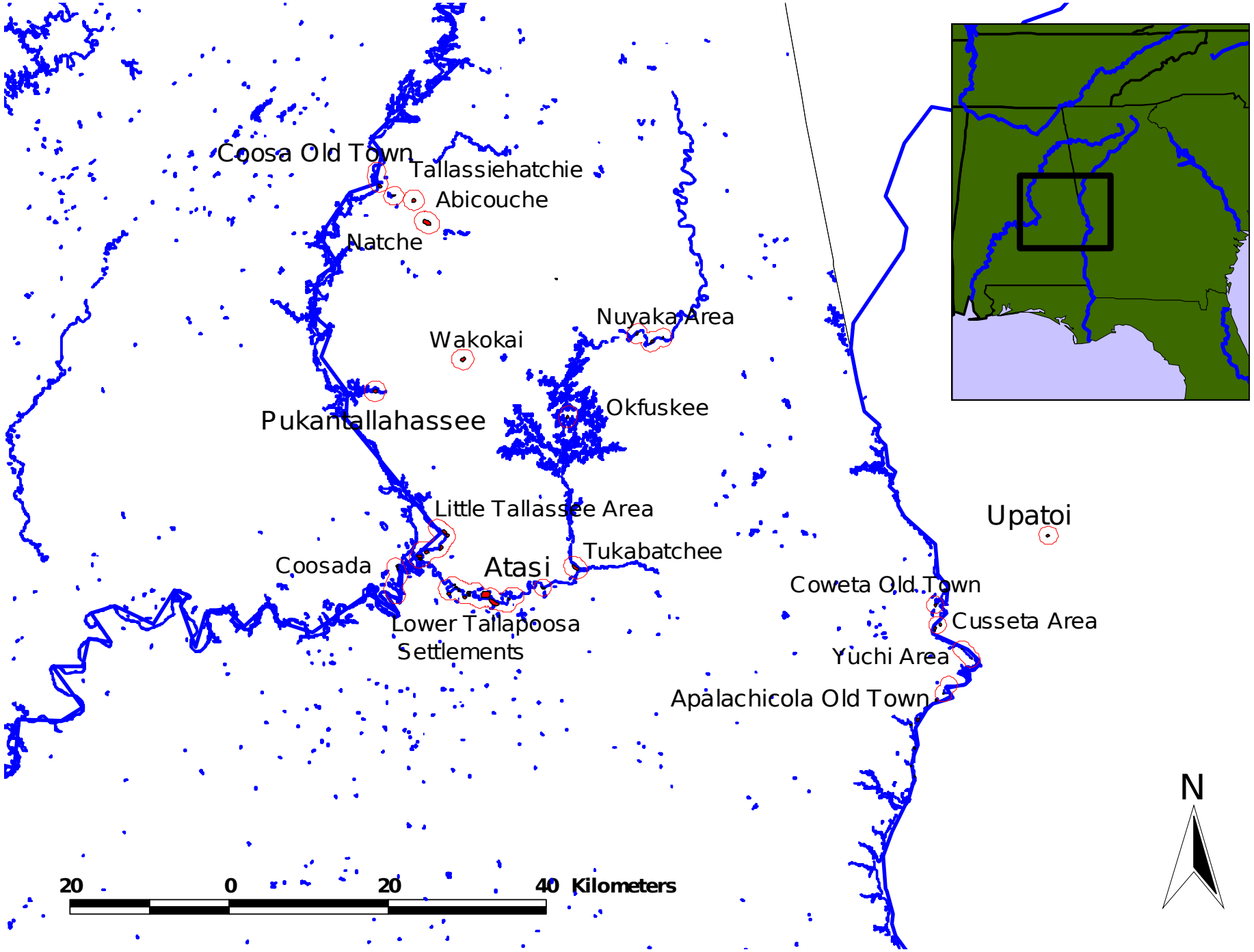
Distance Analysis

- Degree of influence of Native Americans as a function of distance from settlement
- Measured along river bottom
- Control for topographic and edaphic variables

Distance Analysis sample

- Limited to towns that were relatively isolated
- Coosa Old Town measured along the Coosa River
- Tukabatchee measured north of Tukabatchee along the Tallapoosa River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Cusseta Area
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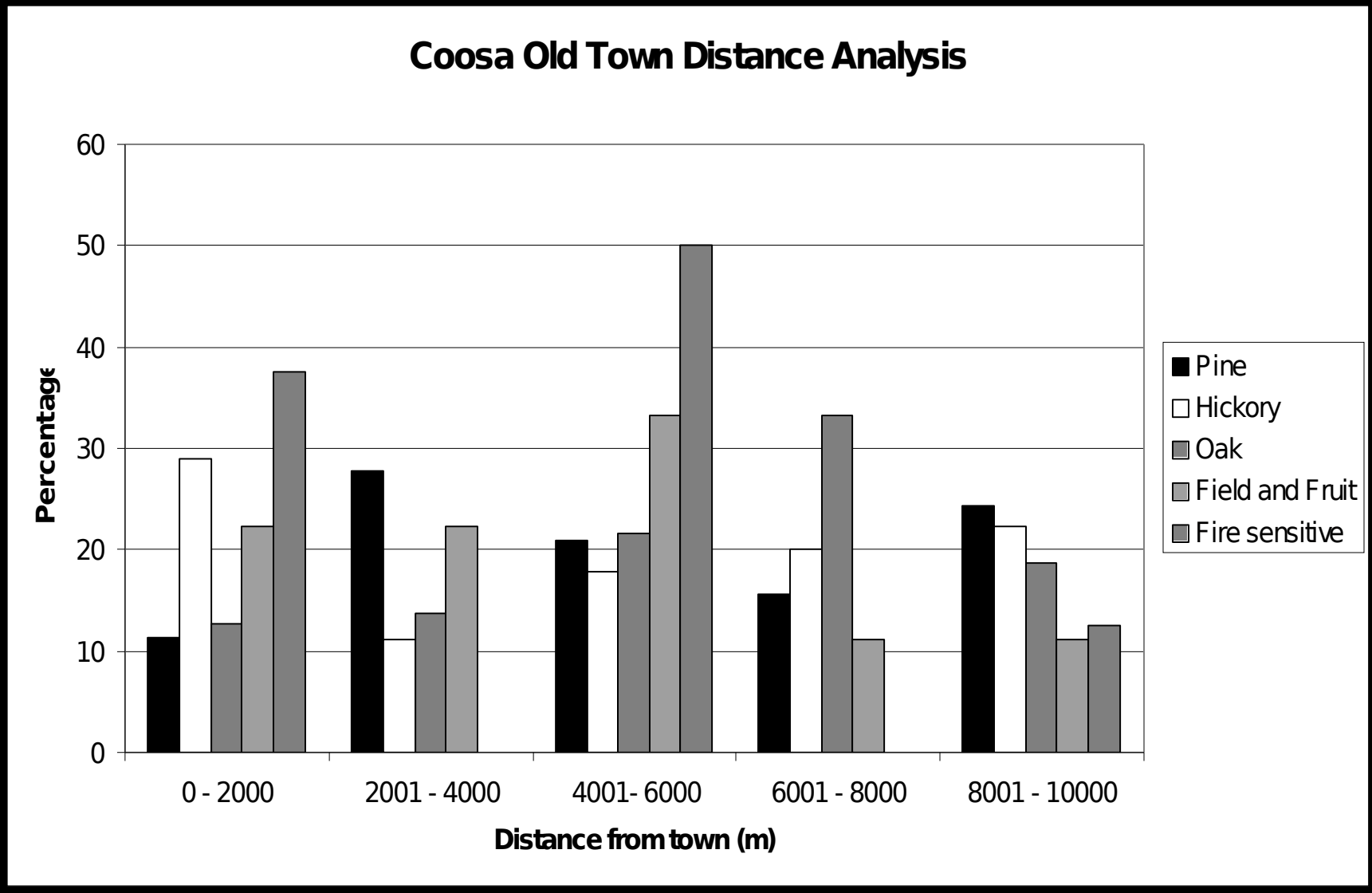
Apalachicola Old Town
20 0 20 40 Kilometers
N

Results: Pine

- *Pinus* spp. increases beyond 2000 meters
- Consistent with catchment results of lower frequency of pine in settlements versus control catchments


Coosa Old Town Distance Analysis
60
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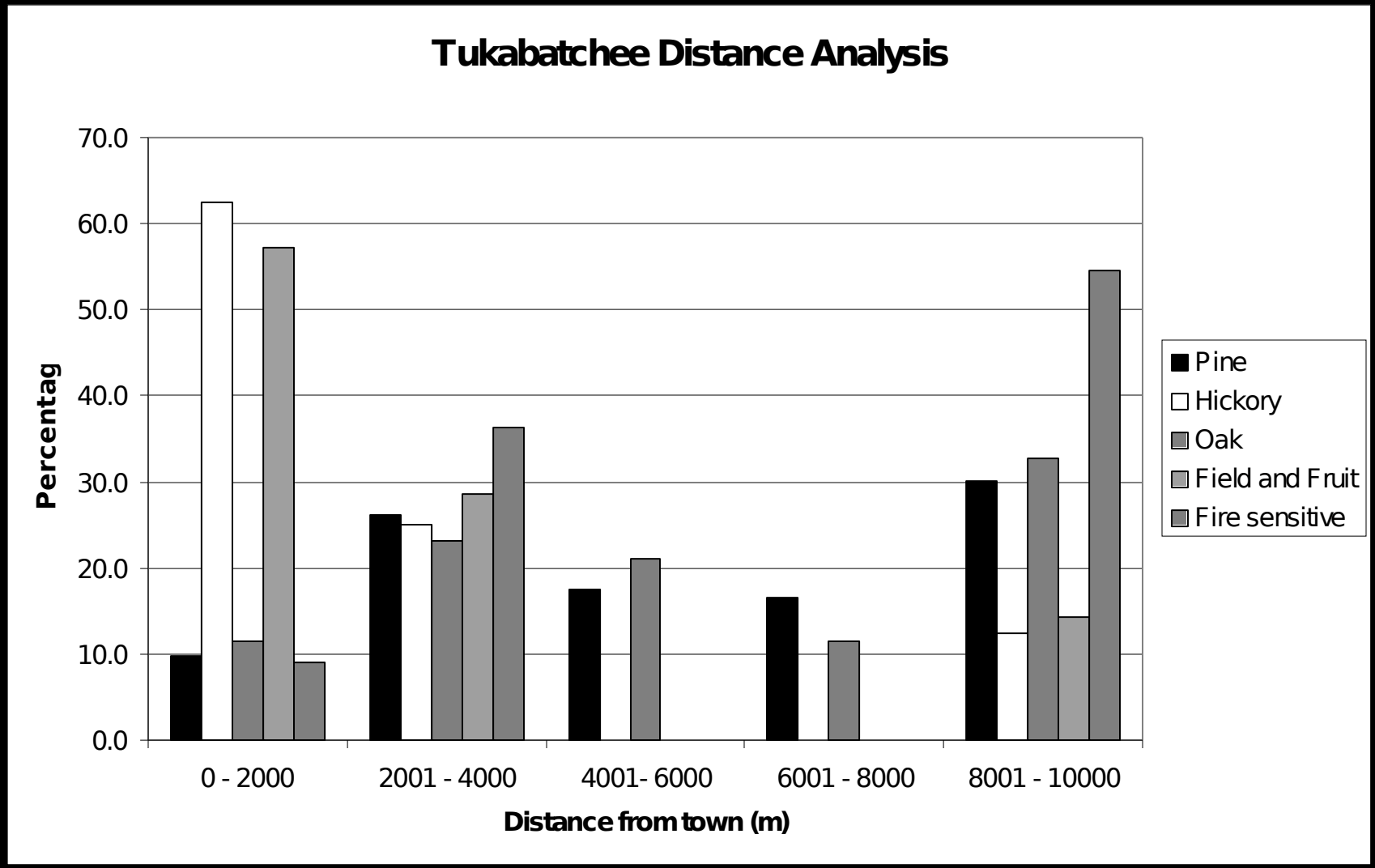
Percentage
0 - 2000
2001 - 4000
4001- 6000
6001 - 8000
8001 - 10000
Distance from town (m)
Pine
Hickory
Oak
Field and Fruit
Fire sensitive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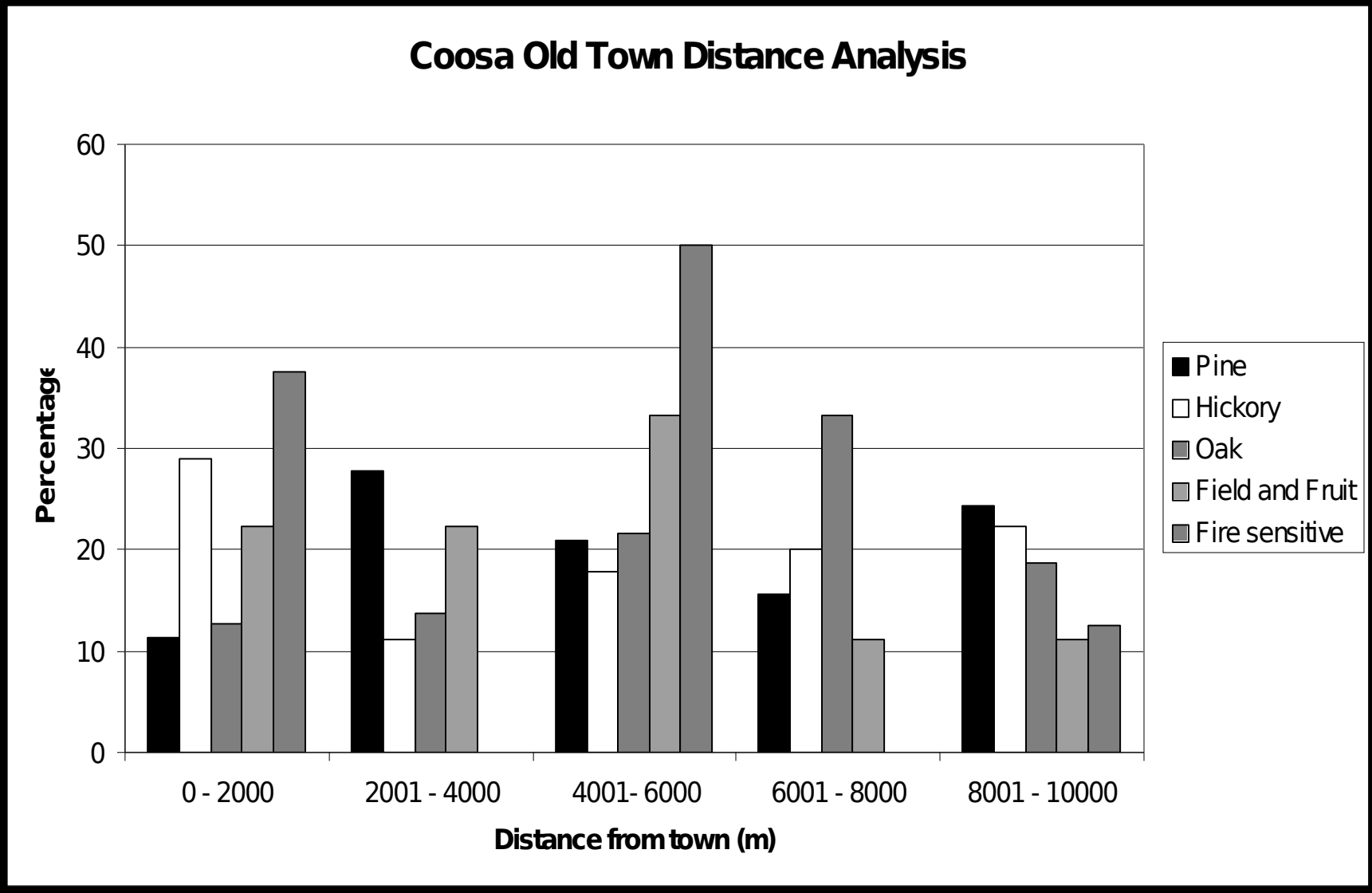
8001 - 10000
Distance from town (m)
Pine
Hickory
Oak
Field and Fruit
Fire sensitive

Results: Pine

- *Pinus* spp. increases beyond 2000 meters
- Related to demand for pine for building materials (houses, etc.)

Results: Hickory

- Frequency of *Carya* spp. is highest within the first 2000 meters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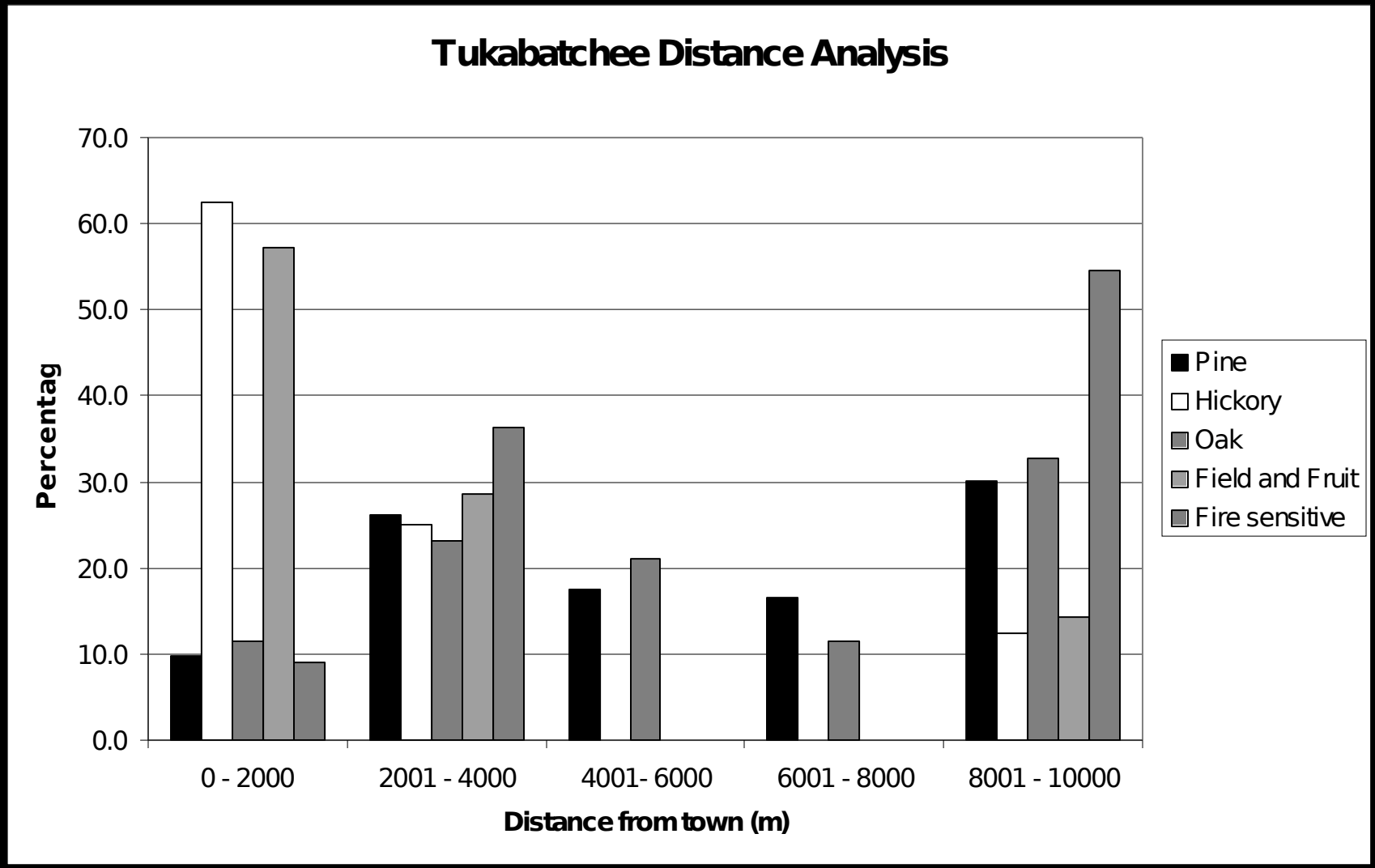
Field and Fruit
Fire sensitive

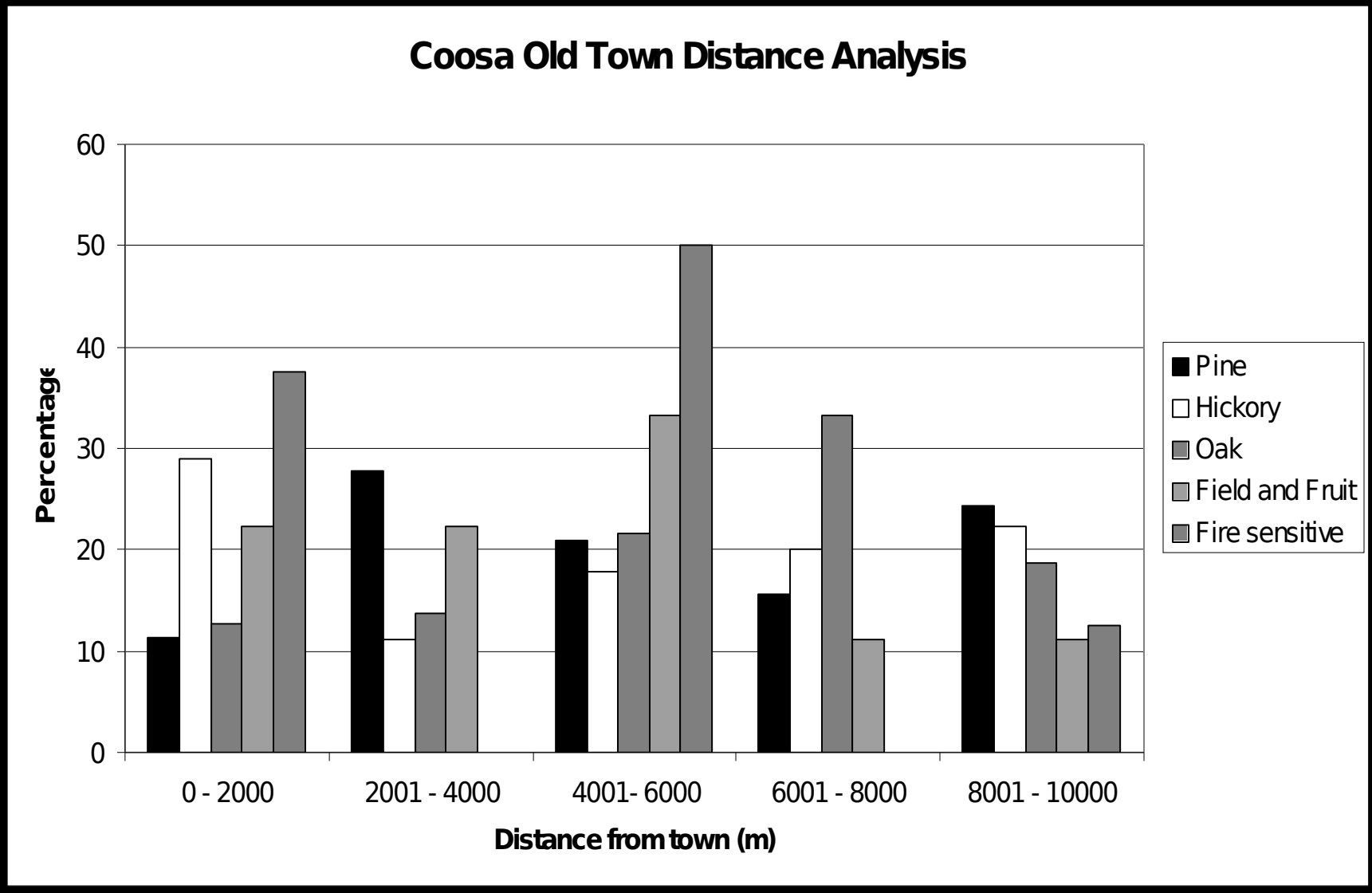

Tukabatchee Distance Analysis
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Percentag
0 - 2000
2001 - 4000
4001- 6000
6001 - 8000
8001 - 10000
Distance from town (m)
Pine
Hickory
Oak
Field and Fruit
Fire sensitive

Results: Hickory

- Frequency of *Carya* spp. is highest within the first 2000 meters
- Central place foraging increases frequency of hickory trees in close proximity to villages

Results: Field and Fruit

- Fruit species: Mulberry (Moraceae), Cherry, Plum, etc. (Prunus)
- Field species: Locust (Gleditsia), Persimmon (Diospyros), Walnut (Castaneae)
- High frequency for the first 4000 to 6000 meters


Coosa Old Town Distance Analysis
60
50
40
30
20
10
0
Percentage
0 - 2000
2001 - 4000
4001- 6000
6001 - 8000
8001 - 10000
Distance from town (m)
Pine
Hickory
Oak
Field and Fruit
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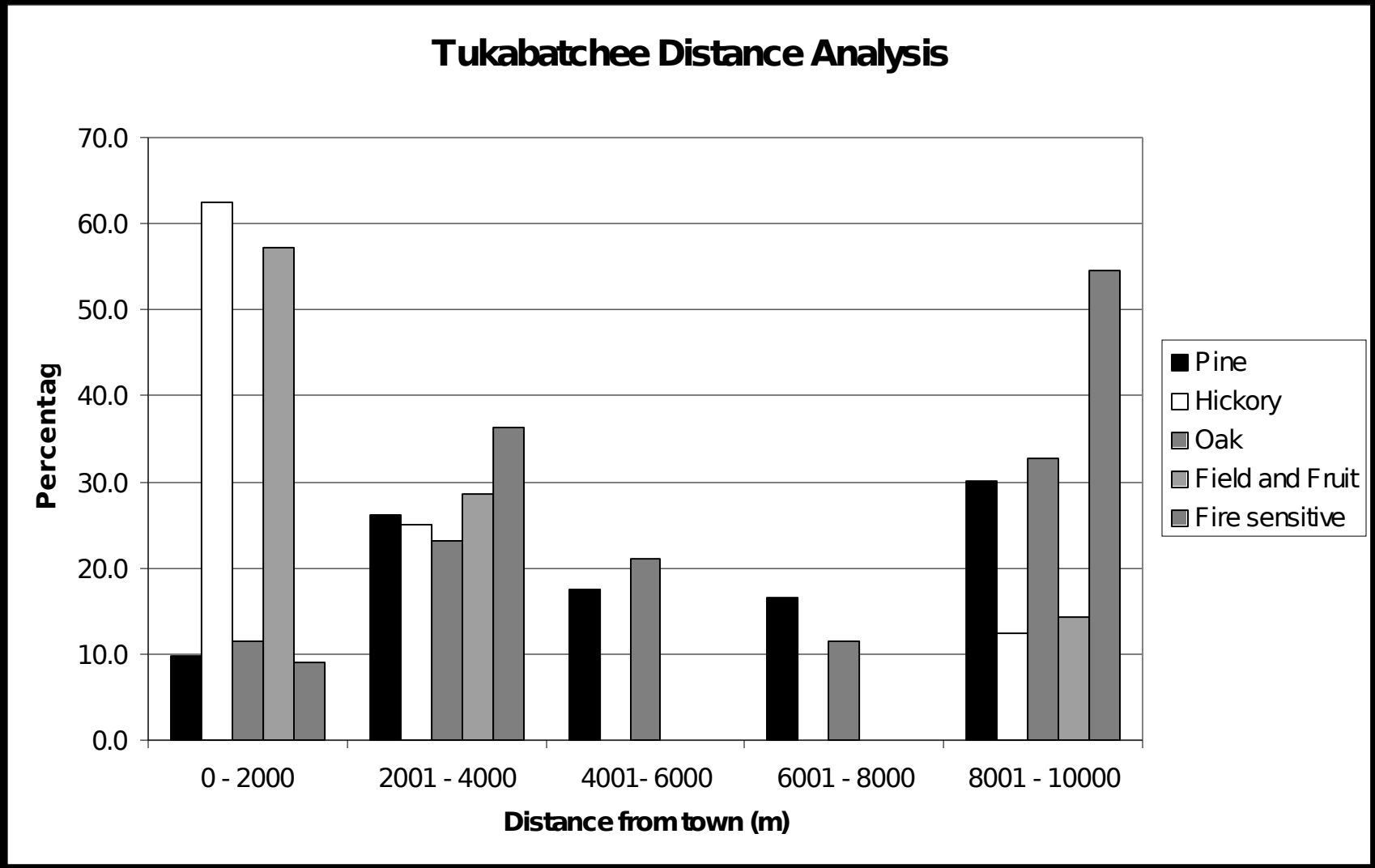
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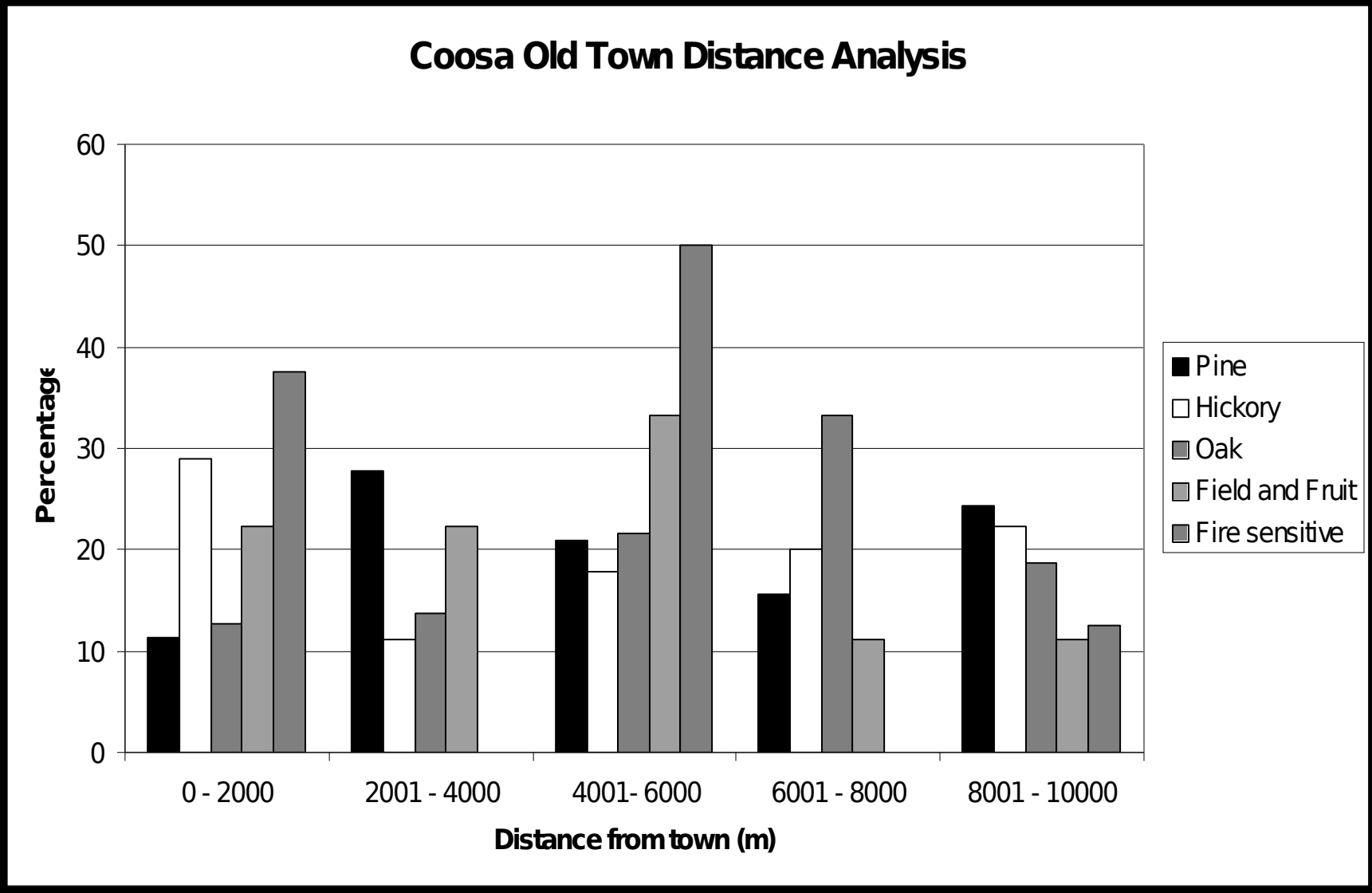
Results: Fire sensitive

- Maple (Acer), Beech (Fagus), Ash (Fraxinus), Poplar (Populus), etc.
- Cyclical pattern of increasing and decreasing frequency
- Possibly related to placement of agricultural fields along the river bottom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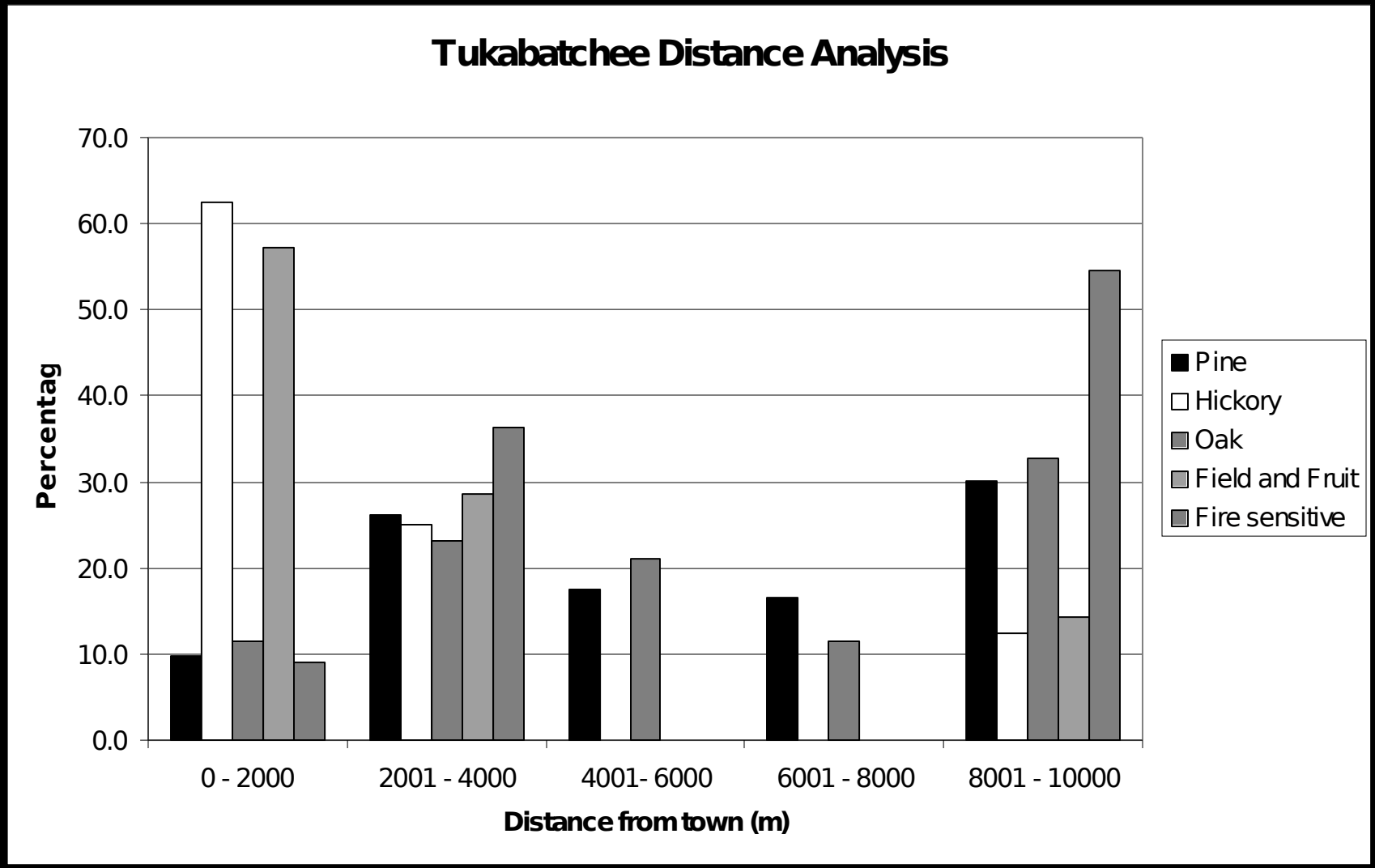
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Distance from town (m)
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Conclusions

- Lower frequency of pine within 2000 meters of villages
- Higher frequency of hickory within 2000 meters of villages
- Higher frequency of field and fruit species within first 4000 to 6000 meters of villages
- Cyclical pattern of fire sensitive species away from villages

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- David Hally, University of Georgia

Witness tree analysis of Native American influences on the distribution of forest trees

Thomas Foster

Panamerican Consultants, Inc.